



INSTITUTE
OF THE MOTOR
INDUSTRY

IMI QUALIFICATION



Assessment Criteria for

IMI Level 4 Certificate in Advanced Automotive Studies for Master Technicians

I.D: 600/6812/7

*To be used in conjunction with Candidate Assessment Summary and
Assignments.*

For assessor use only: Assessor and Verifier Guidance

CENTRE INFORMATION

Please be aware that any **legislation** referred to in this qualification may be subject to amendment/s during the life of this qualification. Therefore IMI Approved Centres must ensure they are aware of and comply with any amendments, e.g. to health and safety legislation and employment practices.

Please be aware that **vehicle technologies** referred to in this qualification reflect current practice, but may be subject to amendment/s, updates and replacements during the life of this qualification. Therefore IMI Approved Centres must ensure they are aware of the latest developments and emerging technologies to ensure the currency of this qualification.

Please note: the relevance of the information contained in the **unit content** will vary depending upon the vehicle types being worked upon. The unit content is for guidance only and is not meant to be prescriptive.

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Requests should be made in writing and addressed to:
Institute of the Motor Industry (IMI)
Fanshaws, Brickendon, Hertford SG13 8PQ



CONTACT SHEET

Learner Name:	
Learner Registration No:	
Learner Address:	
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Please complete as appropriate:	
Witness Name:	Witness Name:
Witness Job Title:	Witness Job Title:
Witness Signature:	Witness Signature:
Witness Name:	Witness Name:
Witness Job Title:	Witness Job Title:
Witness Signature:	Witness Signature:
Assessor Name:	Assessor Name:
Assessor Signature:	Assessor Signature:
Assessor Name:	
Assessor Signature:	
Internal Verifier Name:	Internal Verifier Name:
Internal Verifier Signature:	Internal Verifier Signature:



IMI Level 4 Certificate in Advanced Automotive Studies for Master Technicians I.D.: 600/6812/7

A = Assignment

T = Online test

Learners must achieve a minimum 31 credits.

Group A Units

(Learners must achieve a minimum of 24 credits from this group.)

Unit Ref:	Unit Title and ID Number	GLH	Unit Level	Credit Value	Assignments	
					A	T
MT1	Advanced Internal Combustion Engine Technology (R/504/3812)	50	4	9	M	
MT2	Advanced Vehicle Driveline And Chassis Technology (H/504/3815)	50	4	9	M	
MT3	Advanced Vehicle Body Electrics (D/504/3814)	50	4	9	M	
MT4	Alternative Fuel Vehicles (Y/504/3813)	30	4	6	M	

Max hours from group A= 150

Min hours from group A= 130

Group B Units

(Learners must achieve a minimum of 7 credits from this group.)

Unit Ref:	Unit Title and ID Number	GLH	Unit Level	Credit Value	Assignments	
					A	T
MR15K	Knowledge of Providing Technical Support and Advice to Colleagues in Motor Vehicle Environments (M/502/6449)	47	4	5	M	M
MR16K	Knowledge of Liaising with Vehicle Product Manufacturers and Suppliers on Technical matters (F/502/6455)	47	4	5	M	
MR18K	Knowledge in conducting Diagnostic Consultations with Customers in Motor Vehicle Environments (M/502/6452)	27	4	4	M	
CIAM3	Fundamental Management Principles in the Automotive Industry (H/502/7937)	19	3	3	M	M

Min hours from options= 46

Max hours from options= 94

Total min hours =130+46=176

Total max hours =150+94=244

Average hours = (227+176)/2= 210 hours



UNIT REF: MT1	UNIT TITLE: ADVANCED INTERNAL COMBUSTION ENGINE TECHNOLOGY
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Level: 4	Credit Value: 9	GLH: 50
Rationale: This unit enables the learner to develop knowledge of advanced engine technology, including electronic and computerised systems, appropriate to the role of master technician. It also deals with how modern electronics interact with one another.		

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The Learner will:	The Learner can:
1. Understand alternative engine design features	1.1 Explain the limiting factors on modern engine design 1.2 Critically compare the performance characteristics of a modern Compression Ignition and Spark Ignition engine 1.3 Evaluate Compression Ignition and Spark Ignition Indirect and Direct Injection engine designs 1.4 Evaluate advanced engine design features including variable valve timing and variable valve lift systems 1.5 Evaluate modern intake and exhaust system design including the use of pressure charging
2. Understand alternative engine management systems	2.1. Evaluate modern Compression Ignition and Spark Ignition engine management systems including programmable systems, and emission control systems 2.2 Explain how modern engine management systems monitor the engines operation 2.3 Evaluate the use of multiplexing in engine management systems
3. Understand how to diagnose and rectify engine system faults where no fault codes, or multiple fault codes exist	3.1. Explain fault finding procedures on engine systems using: <ul style="list-style-type: none"> a. Vehicle Communication Interfaces (VCI) with live data streaming b. Multimeters c. Oscilloscopes d. Specialised equipment, e.g. dynamometers, manufacturers' equipment 3.2. Explain how diagnostics may be carried out through the use of remote connections 3.3. Interpret circuit diagrams relating to engine system faults 3.4. Explain why and how engine control units may be re-programmed



<p>4. Be able to carry out engine diagnosis and updating activities where no fault codes, or multiple fault codes exist</p>	<ul style="list-style-type: none">4.1. Use a variety of sources of information to assist in the diagnosis of the fault4.2. Use diagnostic equipment to identify an engine fault relevant to the symptoms presented4.3. Ensure all repaired and replaced components and units conform to the vehicle operating specification and any legal requirements4.4. Adjust components and units correctly to ensure that they operate to meet system requirements4.5. Carry out the interrogation and updating or reprogramming of an engine control unit4.6. Demonstrate testing methods that are suitable for assessing the performance of the system rectified
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Content:

- a. Performance characteristics:
 - 1. Torque
 - 2. Power
 - 3. Mechanical efficiency
 - 4. Thermal efficiency
 - 5. Volumetric efficiency
 - 6. Air/fuel ratios
 - 7. Fuel consumption
 - 8. Emission control
 - 9. Mean effective pressure
 - 10. Performance curves

- b. Direct and indirect injection engine design:
 - 1. Combustion chamber design
 - 2. Cylinder head design
 - 3. Compression pressures and the effects on injection
 - 4. Advantages of direct injection for both petrol and diesel
 - 5. Advantages of indirect injection for both petrol and diesel
 - 6. Injector design features, spray characteristics, injection pressures, injector pulse width
 - 7. Fuel system operating characteristics for petrol and diesel under different driving conditions

- c. Advanced engine design features:
 - 1. Bore diameter, stroke length and con-rod to crank ratio
 - 2. Number and arrangement of cylinders (including rotary engines)
 - 3. Overall engine dimensions
 - 4. Overall engine weight (power to weight ratio)
 - 5. Camshaft design
 - 6. Crankshaft design
 - 7. Piston design
 - 8. Compression ratio
 - 9. modern materials (cost implications)
 - 10. inertia forces
 - 11. emissions (regulations, legislation)
 - 12. noise regulations

- d. Intake and exhaust design:
 - 1. Advantages of naturally aspirated engines
 - 2. Advantages of pressure charged systems
 - 3. Methods of improving volumetric efficiency and the advantages of each
 - 4. Turbo charger design features and the effects of variable geometry turbochargers
 - 5. Bi-turbo and Tri-turbo system design features
 - 6. Variable valve timing systems and their effects
 - 7. Intake manifold design
 - 8. Exhaust design for petrol and diesel fuel systems
 - 9. Effects of exhaust back pressure
 - 10. Operations of catalytic convertors and diesel particulate filters
 - 11. Measurement of exhaust gas emissions and their effects on the environment
 - 12. Construction and operation of lambda sensors

- e. Engine management systems:
 - 1. The function and purpose of engine management systems
 - 2. The difference between analogue, digital, programmable and non-programmable systems
 - 3. Open loop and closed loop control, types of input and output devices
 - 4. The function and operation of digital components and systems
 - 5. The operation of engine management systems under various conditions
 - 6. Digital mapping and the effects of remapping ECUs
 - 7. System sensors for monitoring engine condition
 - 8. Advances in electronic systems including multiplexing



Content continued:

f. Fault diagnosis on modern engines:

1. Identification, evaluation and following diagnostic testing procedures
2. Understanding of electrical and electronic values and data
3. The use of EOBD to identify fault codes
4. The advancement in vehicle diagnostic systems including wireless technology and bluetooth
5. The setting up and use of multi meters including interpreting readouts
6. The setting up and use of amp clamps
7. The setting up and use of oscilloscopes and interpreting different oscilloscope patterns
8. The setting up and use of exhaust gas analyser
9. Evaluation of component measurements – input and output values, consumption, resistance
10. Evaluation and interpretation of test results from diagnostic equipment
11. Identification and understanding of electronic circuit components
12. Interpretation of electronic circuit diagrams and testing procedures



UNIT REF: MT2	UNIT TITLE: ADVANCED VEHICLE DRIVELINE AND CHASSIS TECHNOLOGY
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Level: 4	Credit Value: 9	GLH: 50
<p>Rationale: This unit enables the learner to develop knowledge of advanced vehicle driveline technology, including electronic and computerised systems, appropriate to the role of master technician. It also deals with how modern electronics interact with one another.</p>		

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The Learner will:	The Learner can:
1. Understand electronically controlled transmission systems	1.1. Explain the importance of matching the transmission to the engine 1.2. Evaluate electronically controlled manual and automatic transmission systems 1.3. Compare permanent and part time electronically controlled four wheel drive systems 1.4. Explain the interrelationship between the engine and transmission system
2. Understand electronically controlled chassis systems	2.1. Evaluate the operation of electronically controlled anti-lock braking, traction control and stability control systems 2.2. Analyse the operation of electronically controlled active steering and suspension systems 2.3. Evaluate the use of multiplexing in driveline systems
3. Understand how to diagnose and rectify vehicle transmission and chassis system faults where no fault codes, or multiple fault codes exist	3.1. Evaluate fault finding procedures on vehicle transmission and chassis systems using: <ul style="list-style-type: none"> a. Vehicle Communication Interfaces (VCI) with live data streaming b. Multimeters c. Oscilloscopes d. Specialised equipment, e.g. dynamometers, manufacturers equipment 3.2. Interpret hydraulic and electrical circuit diagrams relating to systems being tested
4. Be able to carry out vehicle transmission and chassis system diagnosis, rectification and updating activities where no fault codes, or multiple fault codes exist	4.1. Use a variety of sources of information to assist in the diagnosis of the fault 4.2. Use diagnostic equipment to identify a vehicle transmission and chassis fault relevant to the symptoms presented 4.3. Ensure all repaired and replaced components and units conform to the vehicle operating specification and any legal requirements 4.4. Adjust components and units correctly to ensure that they operate to meet system requirements 4.5. Demonstrate testing methods that are suitable for assessing the performance of the system rectified

Content:

a. Electronically controlled transmission systems:

1. Evaluating the relationship between the engine and transmission system with regards to economy, power, torque etc
2. Interaction between the electrical/ electronic systems, hydraulic system and mechanical components
3. Electronic control of manual gearboxes
4. Electronic control of clutches
5. Electronic control of torque convertors
6. Electronic control of automatic gearboxes
7. Electronically controlled continuously variable transmission (CVT)
8. Electronic differential and four wheel drive control
9. Interrelationship between transmission ECUs and engine ECUs
10. Use of multiplexing in transmission systems

b. Electronically controlled chassis systems:

1. Four wheeled steering systems
2. Electronic power steering systems
3. Traction control systems
4. Anti lock braking systems
5. Electronic brake distribution systems
6. Electronic brake control systems
7. Self levelling and ride controlled suspension systems
8. Dynamic stability control systems
9. Interrelationship of chassis ECUs and other systems
10. Use of multiplexing in chassis systems

c. Transmission and chassis fault diagnosis:

1. Interpret information for diagnostic tests, vehicle and equipment specifications, use of equipment, testing procedures, test plans, fault codes and legal requirements
2. How to prepare equipment for use in diagnostic testing
3. How to conduct systematic testing and inspection of transmission system, mechanical, hydraulic, electrical and electronic systems using appropriate tools and equipment including, multi-meters, oscilloscope, manufacturer specific diagnostic equipment and pressure gauges
4. How to carry out workshop based and road testing of vehicle and transmission system
5. Evaluate and interpret test results from diagnostic and/or road testing
6. Compare test result and values with vehicle manufacturer's specifications and setting



UNIT REF: MT3	UNIT TITLE: ADVANCED VEHICLE BODY ELECTRICS
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Level: 4	Credit Value: 9	GLH: 50
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Rationale: This unit enables the learner to develop knowledge of advanced vehicle body electrics, appropriate to the role of master technician. It also deals with how modern electronics interact to affect the operation of the vehicle.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The Learner will:	The Learner can:
1. Understand vehicle design and safety systems	1.1 Critically compare alternative multiplex systems used in vehicle body systems including wired and fibre optics 1.2 Evaluate the range of active occupant safety systems available 1.3 Evaluate the range of active pedestrian safety systems available 1.4 Evaluate driver comfort and convenience aids including those that are programmable to the occupants preference 1.5 Analyse vehicle telematic systems and their function 1.6 Explain the operation of driver assistance aids including head up displays, lane departure warning, night vision and cameras
2. Understand how to diagnose and rectify vehicle body system faults where no fault codes, or multiple fault codes exist	2.1. Evaluate fault finding procedures on a vehicle body system using: <ul style="list-style-type: none"> a. Vehicle Communication Interfaces (VCI) with live data streaming b. Multimeters c. Oscilloscopes d. Specialised equipment e.g. manufacturers' equipment 2.2. Interpret circuit diagrams relating to systems being tested
3. Be able to carry out vehicle body system diagnosis and updating activities where no fault codes, or multiple fault codes exist	3.1. Use a variety of sources of information to assist in the diagnosis of the fault 3.2. Use diagnostic equipment to identify a vehicle body system fault relevant to the symptoms presented 3.3. Ensure all repaired and replaced components and units conform to the vehicle operating specification and any legal requirements 3.4. Adjust components and units correctly to ensure that they operate to meet system requirements 3.5. Carry out the programming of a body control unit to meet with customer requirements 3.6. Demonstrate testing methods that are suitable for assessing the performance of the system rectified

Content continued:

a. Vehicle design and safety systems:

1. Evaluate the advantages of the use of multiplexing, CANBUS, flexray, MOST, fibre optics and wired systems in electronic controlled body electric and infotainment systems
2. Operation of passive and active safety systems such as seat belt pre-tensioners, airbags, side impact protection, seat mounted airbags etc
3. Operation of active pedestrian safety systems including the legislation behind advances in this area
4. Operation of climate control including dual control systems
5. Operation of heated seats, electronically adjusted seats and memory setting systems
6. Operation of reversing cameras
7. Operation of head up displays
8. Operation of lane departure warning systems
9. Operation of automatic wiper control and headlight illumination
10. Advances in vehicle telemetry to include preventive maintenance, vehicle monitoring and theft control

b. Body Electrics fault diagnosis:

1. Interpret information for diagnostic tests, vehicle and equipment specifications, use of equipment, testing procedures, test plans, fault codes and legal requirements
2. How to prepare equipment for use in diagnostic testing
3. How to conduct systematic testing and inspection of body electrical and electronic systems using appropriate tools and equipment including, multi-meters, oscilloscope, hand held diagnostic equipment and manufacturer specific diagnostic equipment
4. How to carry out workshop based and road testing of body electric systems
5. Evaluate and interpret test results from diagnostic and/or road testing
6. Compare test result and values with vehicle manufacturer's specifications and setting



UNIT REF: MT4	UNIT TITLE: ALTERNATIVE FUEL VEHICLES
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Level: 4	Credit Value: 6	GLH: 30
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Rationale: This unit enables the learner to develop knowledge of alternative fuel vehicle systems available, appropriate to the role of master technician. It also deals with how modern electronics interact with one another.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The Learner will:	The Learner can:
1. Understand alternative vehicle fuel types	1.1. Analyse the benefits of alternative fuels over conventional fuels 1.2. Compare alternative fuel types for internal combustion engines including LPG, CNG, ethanol and bio-fuels 1.3. Analyse the engine design features required to use alternative fuels
2. Understand Electric Vehicle designs	2.1. Explain the benefits of Hybrid and Electric vehicles 2.2. Critically compare the range of Electric Vehicle types available including hybrid, full electric and fuel cell. 2.3. Analyse the operation of an electric vehicle high energy system 2.4. Explain the methods of onboard energy generation 2.5. Evaluate the methods used by vehicle manufacturers to reduce the risk to injury

Content:

a. Alternative Fuel types:

1. Identify the range of alternative fuels used in vehicle design such as LPG, LNG, CNG, bio-alcohol and ethanol, bio-diesel, steam etc
2. Analyse the benefits of each alternative fuel with regards to economic advantages and environmental benefits
3. Analyse the effects on engine power and consumption for each alternative fuel in comparison to normal SI and CI engine figures
4. Compare the conversion process for each alternative fuel and its benefits – to include costs, mileage to break even figures and annual mileages to warrant the cost of conversion
5. Explore and analyse the relevant design features for each alternative fuel with regards to engine design and specific materials required for engine component manufacture.
6. Analyse the vehicle design features required to accommodate alternative fuel conversions and their effects

b. Electric Vehicle Design:

1. History of electric vehicles
2. Need for hybrids/ electric vehicles
3. Types of Electric vehicle including, Battery electric vehicle, ICE/ electric hybrid, fuelled electric vehicle, solar powered vehicle, super capacitors
4. Electric vehicle safety precautions including power down and deactivation
5. Definition of High Voltage
6. High Voltage measurement and equipment
7. Electric vehicle design characteristics including; rolling resistance, transmission efficiency, aerodynamics, vehicle mass, chassis and body design
8. Operation of electric motors to drive vehicles
9. Battery technology including; nickel metal hydride, lithium Ion, High voltage batteries, ultras capacitors and variable regulation lead acid (VRLA)
10. Parallel and series hybrid design features including the advantages and disadvantages of each
11. Regenerative braking systems
12. Modes of hybrid operation
13. Hydrogen fuel cell operation
14. Global effects of electric vehicles
15. Electric vehicle charging
16. Electric vehicle national charging infrastructure including fast charge systems



UNIT REF: MR15K	UNIT TITLE: KNOWLEDGE OF PROVIDING TECHNICAL SUPPORT AND ADVICE TO COLLEAGUES IN MOTOR VEHICLE ENVIRONMENTS
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Level: 4	Credit Value: 5	GLH: 47
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Mapping: This unit is mapped to the IMI NOS LV15 1-29 are covered in LV14 (Mandatory Units – LV14 to LV18).

Rationale: This unit enables the learner to develop knowledge to enable them to provide a range of up-to-date technical support, information, advice, instruction and briefings to other workshop colleagues to support smooth workshop operation.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The Learner will:	The Learner can:
1. Understand how to file, present and demonstrate technical information to workshop colleagues	1.1. Explain how to file and store technical information effectively 1.2. Describe effective techniques and methods to give straightforward presentations on technical matters 1.3. Describe effective techniques and methods of instructing colleagues and demonstrate tasks clearly and correctly
2. Understand how to check colleagues work, give effective and positive feedback, advice and guidance	2.1. Describe methods of effectively checking colleagues work 2.2. State the best action to take when a colleagues work is not in line with requirements 2.3. Explain how to discuss colleagues work with them in a way that will encourage them to be positive and not lead to conflict 2.4. Describe ways of giving advice and guidance that is appropriate to individual colleagues you are supporting 2.5. Explain what might happen if a colleagues self confidence is undermined when correcting mistakes 2.6. State the importance of liaising with their manager when evaluating colleagues work and giving feedback
3. Understand how to recognise a training need and the importance of continuous development and learning	3.1. Describe methods and techniques used to recognise training needs in colleagues 3.2. State the importance of continuous development and learning



Content:

- a. Explain how to file and store technical information effectively. Technical information should be stored:
 - 1. tidily
 - 2. logically
 - 3. securely
 - 4. to comply with company health and safety, data and copyright policies

- b. Filed technical information should:
 - 1. be either computer based or paper based
 - 2. have back up facilities for computer based files, i.e. hard copies or disks

- c. Presentation and demonstration methods:
 - 1. one to one
 - 2. group
 - 3. formal (workshop or appropriate workplace area)
 - 4. informal (workshop or appropriate workplace area)

- d. Effective techniques and methods of instructing colleagues:
 - 1. determine individual support needs
 - 2. inclusiveness: be supportive towards all individuals
 - 3. ensure interruptions and distractions are kept to a minimum
 - 4. the importance of correct location and timing
 - 5. avoid embarrassment of individuals
 - 6. logical step by step process
 - 7. check and assess learner understanding throughout

- e.
 - 1. Methods of checking colleagues work:
 - i. direct observation of colleagues
 - ii. indirect observation of colleagues
 - iii. effective questioning for technical understanding
 - iv. third party statements from colleagues, supervisor and customers
 - 2. Best action to take when a colleagues work is not in line with requirements:
 - i. provide encouragement and understanding
 - ii. positively praise achievement
 - iii. correct individual errors
 - 3. Discuss colleagues work with them in a way that will encourage them to be positive and not lead to conflict:
 - i. show empathy and leadership
 - ii. provide ongoing advice and support
 - iii. feedback must always be positive
 - iv. avoid embarrassment of colleagues
 - 4. Give advice and guidance that is appropriate to individual colleagues:
 - i. ensure interruptions and distractions are kept to a minimum
 - ii. the importance of correct location and timing

- f. The importance of liaising with managers and supervisors:
 - 1. analysis of training requirements of colleagues which may lead to:
 - i. further training in house training (demonstrations & presentations)
 - ii. manufacturers' courses
 - iii. individual coaching
 - iv. individual mentoring

Content continued:

- g. Recognising training needs through:
 - 1. analysing individual workplace performance through observations
 - 2. analysing how regular individuals ask for assistance
 - 3. analysing how regular individuals ask for advice
 - 4. analysing inability to use relevant equipment
 - 5. analysing inability to diagnose system faults
 - 6. analysing failure to carry out work to recognised company/ industrial standards
 - 7. the learner's failure to complete task in required time
 - 8. analysing customer complaints

- h. The importance of continuous development and learning:
 - 1. improve task time
 - 2. improve practical techniques
 - 3. reduce customer complaints
 - 4. improve performance with further in house training
 - 5. improve with standards with further manufacturers' courses
 - 6. improve standards with individual coaching
 - 7. improve performance with individual mentoring
 - 8. continuous discussion and encouragement with individuals to improve self-esteem



UNIT REF: MR16K	UNIT TITLE: KNOWLEDGE OF LIAISING WITH VEHICLE PRODUCT MANUFACTURERS AND SUPPLIERS ON TECHNICAL MATTERS
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Level: 4	Credit Value: 5	GLH: 47
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Mapping: This unit is mapped to the IMI NOS LV16 1-29 are covered in LV14 (Mandatory Units – LV14 to LV18).

Rationale: This unit enables the learner to develop knowledge to obtain and provide information to and from manufacturers and suppliers for diagnostic activities, warranty activities, repairs and to support product development.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The Learner will:	The Learner can:
1. Understand how to communicate effectively with manufacturers, suppliers, managers, colleagues and customers	1.1. Describe effective communication techniques, methods and procedures to obtain and provide information from: <ul style="list-style-type: none"> a. manufacturers b. suppliers c. managers d. colleagues e. customers 1.2. Justify when it is appropriate to contact manufacturers or suppliers on technical matters 1.3. Differentiate between the limits of their authority and of other designated personnel when liaising with manufacturers or suppliers on technical matters 1.4. Describe their workplace procedures for gaining up to date technical information and repair methods
2. Understand how to access reporting systems, compile reports and process information	2.1. Explain how to access reporting systems on which they work 2.2. Describe efficient methods and procedures for processing information and compiling reports

Content:

- a.
 - 1. Effective communication by:
 - i. face to face
 - ii. telephone
 - iii. email
 - iv. fax
 - 2. recognising the importance of polite greetings
 - 3. recognising the importance of viewpoints of others
 - 4. responding appropriately and effectively
 - 5. using effective listening skills
 - 6. distinguishing facts from non facts
 - 7. providing factual information
 - 8. avoiding confrontations
 - 9. being empathetic
 - 10. not being defensive
 - 11. providing clear simplified explanations of:
 - i. data
 - ii. terminology
 - 12. communication must be clear:
 - i. using appropriate tone of speech
 - ii. using appropriate pace of communication
 - 13. using appropriate communication techniques for different scenarios involving:
 - i. anger
 - ii. apprehension
 - iii. confusion
 - iv. frustration
 - v. nervousness
- b. Justify when it is appropriate to contact manufacturers and suppliers:
 - 1. product up dates
 - 2. warranty claims
 - 3. product clarification
 - 4. product development
 - 5. technical clarification
 - 6. product health and safety policies
- c. Differentiate between the limits of authority
 - 1. understand your own organisational and job role requirements
 - 2. understand organisational personnel structure and job roles
 - 3. understand your own knowledge and awareness of manufacturers' products
- d. Workplace procedures for gaining up to date technical information
 - 1. understand your own organisational and job role requirements
 - 2. understand organisational personnel structure and their job role
 - 3. understand your own knowledge and awareness of manufacturers' products
- e. Access reporting systems
 - 1. understand company policies and procedures on accessing & reporting systems
 - 2. reporting & information systems are:
 - i. paper based
 - ii. computer based (e.g. computer station positioned in workshop, office or reception)
- f. Reports will:
 - 1. comply with data protection and copyright policies
 - 2. be compiled and stored in line with company policies



UNIT REF: MR18K	UNIT TITLE: : KNOWLEDGE IN CONDUCTING DIAGNOSTIC CONSULTATIONS WITH CUSTOMERS IN MOTOR VEHICLE ENVIRONMENTS
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Level: 4	Credit Value: 4	GLH: 27
Mapping: This unit is mapped to the IMI NOS LV18 1-29 are covered in LV14, LV18 30 is covered in LV15, (Mandatory Units – LV14 to LV18).		
Rationale: This unit enables the learner to develop the knowledge required to carry out diagnostic consultations with customers including making recommendations to ensure the customers concerns are addressed and that the customer fully understands the problems with their vehicle.		

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The Learner will:	The Learner can:
1. Understand how to communicate effectively with customers, offer good customer care and present themselves in a suitable and professional manner	1.1. Describe methods and techniques used to communicate effectively with customers and listen to their concerns 1.2. Describe different customer reactions and methods and techniques used to recognise and handle them effectively 1.3. Explain effective ways of adapting their language when explaining technical matters to customers 1.4. Describe effective questioning techniques to enable them to fully understand the problems with the vehicle 1.5. Explain how to care for customers and achieve customer satisfaction 1.6. Explain how resolving customer concerns and problems effectively and promptly contributes to customer loyalty and improved relationships 1.7. Describe how to present themselves in a positive and professional manner to customers 1.8. Justify workplace requirements for personal appearance and conduct when dealing with customers

Content:

- a. Communicate effectively by:
 - 1. recognising the importance customer greetings
 - 2. selecting an appropriate location to meet customers:
 - i. office
 - ii. reception
 - iii. workshop
 - iv. showroom
 - 3. using effective listening skills
- b. Different customer reactions:
 - 1. anger
 - 2. apprehension
 - 3. confusion
 - 4. frustration
 - 5. nervousness
- c. Handle customer reactions effectively by:
 - 1. recognising the importance of arguments and viewpoints of others
 - 2. responding appropriately and effectively
 - 3. distinguishing facts from non facts
 - 4. providing factual information
 - 5. avoiding confrontations
 - 6. being empathetic
 - 7. not being defensive
 - 8. being polite
- d. Adapting effective technical language by:
 - 1. providing clear simplified explanations of:
 - i. data
 - ii. terminology
- e. Questioning techniques:
 - 1. must be polite
 - 2. must be clear
 - 3. must have appropriate tone of speech
 - 4. must have appropriate pace of communication
- f. Question customers to:
 - 1. clarify vehicle fault and symptoms
 - 2. clarify sequence of events leading up to fault and symptoms
 - 3. clarify recent repairs that may be relevant
 - 4. evaluate information provided by customer
 - 5. identify possible connection between information and fault



Content continued:

- g. Customer care, concerns and satisfaction:
 - 1. using appropriate techniques for different customer behaviours, such as:
 - i. anger
 - ii. apprehension
 - iii. confusion
 - iv. frustration
 - v. nervousness
 - 2. always remain calm
 - 3. always be polite
 - 4. appropriate tone of speech
 - 5. appropriate pace of communication
 - 6. good body language
 - 7. recognise the importance of greeting customers appropriately
 - 8. select an appropriate location to meet customers
- h. Workplace requirements for personal appearance and conduct:
 - 1. understand organisational requirements
 - 2. understand current the equal opportunities policy



UNIT REF: CIAM3	UNIT TITLE: FUNDAMENTAL MANAGEMENT PRINCIPLES IN THE AUTOMOTIVE INDUSTRY
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Level: 3	Credit Value: 3	GLH: 19
<p>Mapping: This unit is mapped to MSC A2 Manage your own resources and professional development, MSC B6 Provide leadership in your area of responsibility, MSC B11 Promote equality of opportunity, diversity and inclusion in your area of responsibility, MSC C5 Plan change, MSC C6 Implement change, MSC D6 Allocate and monitor the progress and quality of work in your area of responsibility.</p>		
<p>Rationale: This unit addresses the fundamental principles of work and operation that are essential to those who manage in the automotive sector.</p>		

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The Learner will:	The Learner can:
1. Know how to motivate themselves and others within automotive operations	1.1. Identify factors which motivate and encourage 1.2. Explain how personal goals can impact, positively or negatively, on motivation at work
2. Know how to lead teams of colleagues within automotive operations	2.1. Identify different types of teams commonly found in vehicle sales/service/repair operations 2.2. Explain what is required for a team to work effectively 2.3. Explain the roles of individuals within teams 2.4. Identify leadership skills and behaviour
3. Be able to communicate effectively with others in the work place	3.1. Identify various forms of communication 3.2. Apply the most appropriate form of communication in particular circumstances 3.3. Explain the benefits of effective communication
4. Be able to respond positively to change within automotive operations	4.1 Determine the causes of change and how it can impact on the business and individuals 4.2 Devise and apply processes that provide an effective measurement of change

<p>Content:</p> <p>The learner should understand and/or be able to apply:</p> <p>1.a Motivational needs and how they influence the satisfaction of a job-holder including:</p> <ul style="list-style-type: none"> i. the meaning of personal goals and values ii. understanding characteristics of individuals and how they respond to different motivational factors iii. differences between motivation and incentive iv. hierarchy of motivational needs v. understand own motivational factors including need, want and desire * vi. expectations of the job and managing progression of competence within the role * vii. social motivational factors and benefits *

Content:

- 1.b Impact of personal goals on motivation at work including:
 - i. understanding own career goals and objectives
 - ii. identifying a career path that will satisfy personal goals and work objectives
 - iii. planning personal development to achieve own career goals
 - i. impact of planned and unplanned career paths on motivation at work

- 2.a Team leadership of colleagues within vehicle operations including:
 - i. understanding team culture and how it varies between vehicle operations departments
 - ii. understanding team matrices and how they vary with organisational ethos
 - iii. defining and matching roles to characters and types *
 - iv. different types of teams commonly found in vehicle sales/service/repair premises *
 - v. how different characters joining a team may vary the team dynamic and performance
 - vi. structuring a team to achieve optimum performance and harmony
 - vii. the purpose of management communication *
 - viii. delivering praise and maintaining discipline at work

- 2.b The fundamentals of leadership including:
 - i. the qualities, characteristics and meaning of good leadership *
 - ii. how good leaders can influence, motivate and inspire others
 - iii. the benefits and importance of leadership to team working and the organisation
 - iv. different management styles and their concepts *
 - v. the roles of the team leader *
 - vi. being able to identify strengths and limitations in own leadership style

- 2.c The fundamental processes of managing including:
 - i. planning, organising, controlling and decision-making
 - ii. motivating, communicating, measuring performance, giving feedback
 - iii. the processes for operating and deploying the above strategies of management
 - iv. how management qualities and characteristics influence effective team working

- 2.d Requirements for a team to work effectively including:
 - i. the importance of leadership in promoting effective team working
 - ii. the importance of recognising each individual's contribution to effective team working
 - iii. the process of allocating and progressing work to achieve quality standards and deadlines
 - iv. effective team interaction and the benefits of team working*
 - v. the impact of individual motivators on team working
 - vi. team leadership accountability and delegation of responsibility and authority within the team
 - vii. behaviour which encourages and promotes positive team working *
 - viii. barriers to effective team working

- 3.a Effective communication within vehicle operations
 - i. the principles and benefits of good communication *
 - ii. the relationship between communication and effective management
 - iii. the importance of communicating company goals and the strategy
 - iv. the importance of frequent communication with the team and individuals *
 - v. methods of communicating with the team collectively and individually *
 - vi. the communication of work-related context as well as job content
 - vii. the importance of using appropriate forms of communication to suit circumstances
 - viii. the two-way process of communication and how it can be effectively implemented
 - ix. inviting input from colleagues in the decision making process
 - x. the impact of poor communication on the team and on others who interact with the team
 - xi. develop a communication strategy to encourage and facilitate feedback

Content:

- 4.a. Managing the team through change within the organisation, including:
 - i. the need for change and main causes of change *
 - ii. methods that control and effect response to change
 - iii. identify and justify required changes to procedures, systems, structures and roles
 - iv. planning change and how it will happen
 - v. strategy for communicating the need for change, its progress and effects to all involved
 - vi. identify, assess and manage barriers to change
 - vii. identify and implement training and support for people affected by change
 - viii. implementing, managing and measuring the effect of change
 - ix. opportunities for the business provided by change *
 - x. impact of change on the individual *

- 4.b. Managing the effects of change within the organisation, including:
 - i. how change can impact on business performance *
 - ii. how change can affect business requirements *
 - iii. assessing the risks and benefits associated with strategies and plans for change
 - iv. developing contingency plan
 - v. assessing the need for new resources
 - vi. developing systems to monitor and assess progress of change

*** NOTES:**

- 1.a.v working conditions, colleagues, work expectations, competence, equipment, appreciation, praise, career potential etc.
- 1.a.vi management style, attitude, ability, knowledge, training, opportunities etc.
- 1.a.vii car, phone, fuel, pension plan, health plan, bonus, status, recognition, responsibility, empowerment etc.
- 2.a.iii Belbin team roles and behaviours, roles people adopt within a team, team-focused leadership, etc.
- 2.a.iv permanent and short term, functional teams (e.g. the parts staff), cross functional (e.g. a dealership team), management teams, project teams etc.
- 2.a.vii decision making, organising, influencing, consulting, instructing etc.
- 2.b.i visionary, enthusiastic, flair, innovative, confident, respected, good communicator, knowledgeable, dedicated, decisive, empathic, honest, trusted, etc.
- 2.b.iv autocratic, democratic, consultative, dominant, passive, aggressive etc.
- 2.b.v mentor, facilitator, monitor, co-ordinator, director, producer, broker, innovator, etc.
- 2.d.iv positive performance, good working relationships, improved morale, greater efficiency and productivity etc.
- 2.d.vii loyalty, helpfulness, openness, respect, empathy, accessibility, direction etc.
- 2.d.ix criticising colleagues, failure to keep promises, failure to meet deadlines, failure to recognise the needs of others, poor communication etc.
- 3.a.i team morale, performance of colleagues, customer satisfaction and retention, business performance etc.
- 3.a.iv maintain motivation and morale, involve colleagues in decision making, disseminate information, inform colleagues of actions or decisions, request feedback, encourage participation and involvement, report progress made towards achieving company goals, etc
- 3.a.v formal and informal, verbal, individual and group dialogue, group presentations, telephone, written letters, memorandum, email, reports, newsletters, notice board etc
- 4.a.i technical, legal, economic, political, social, demographic, business practices, structural, financial etc
- 4.a.ii SWOT analysis, setting objectives, planning, measuring, continuous improvement etc.
- 4.a.ix improving business performance, gaining new business, restructuring to meet new requirements, changing attitudes and culture etc
- 4.a.x affect on personal confidence, financial implications, skill gaps created, training needs, contingency etc.
- 4.b.i increase or loss of competitiveness, new image and awareness, new opportunities etc.
- 4.b.ii new equipment and tooling, new skills required, new business practices, additional resource, additional expense, increased workload, new customer demands and expectations etc.