

Level 4 Certificate in Advanced Vehicle Diagnostics and Management Competence (4122-04/94)

August 2018 Version 1.1



Qualification at a glance

Subject area	Advanced Automotive Diagnostic and Management Competence
City & Guilds number	4122
Age group approved	18+
Assessment	Knowledge questions and portfolio of evidence.
Fast track	Not available
Support materials	Centre handbook Assessment pack Tracking Sheets
Registration and certification	Consult the Walled Garden/Online Catalogue for last dates

Title and level	City & Guilds number	Accreditation number
Level 4 Certificate in Advanced Vehicle Diagnostics and Management Competence	4122-04	600/9425/4

Version and Detail	Change Detail	Section
1.1 August 2108	Updated data protection legislation, removing reference to specific date of legislation	Throughout



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1 Introduction

This document tells you what you need to do to deliver the qualification:

Area	Description
Who is the qualification for?	For candidates who are progressing from Level 3 or those already working at Level 4 wishing to have recognition of their skills and knowledge. Job roles this qualification may lead to or be of interest to are master/senior technician and workshop controller.
What does the qualification cover?	The Level 4 enables learners to enhance their logical thinking skills. Learners completing a level 3 qualification in Vehicle Maintenance and Repair will already have some knowledge of diagnosing and fixing faults. However, higher level advanced diagnostic skills require not only technical skills but the ability to carry out logical, structured thinking, investigation processes and resolution skills. These skills only come from higher level fault finding independent experience and professional discussion with Master Technicians plus self learning.
What opportunities for progression are there?	It allows candidates to progress into employment or to the following qualifications: <ul style="list-style-type: none">• Level 5 Higher Apprenticeship in Automotive Leadership and Management• Foundation Degree in Automotive Engineering or Automotive Technology

Structure

To achieve the Level 4 Certificate in Advanced Vehicle Diagnostics and Management Competence, learners must achieve **28** credits from the mandatory units and a minimum of **8** credits from the optional units available.

Level 4 Certificate in Advanced Vehicle Diagnostics and Management Competence

Unit accreditation number	City & Guilds unit number	Unit title	Credit value
Mandatory			
D/502/6446	400	Competency in diagnosing motor vehicle faults where no prescribed process or format is available	7
Y/502/6445	401	Knowledge of diagnosing motor vehicle faults where no prescribed process or format is available in motor vehicle environments	5
J/502/6456	402	Competency in providing diagnostic equipment and technical information system support in motor vehicle environments	4
L/502/6457	403	Knowledge of providing diagnostic equipment and technical information system support in motor vehicle environments	2
K/502/6448	404	Competency in providing technical support and advice to colleagues in motor vehicle environments	5
M/502/6449	405	Knowledge of providing technical support and advice to colleagues in motor vehicle environments	5
Optional			
A/503/4098	301	Automotive safety and legal requirements	4
F/503/4099	302	Organise effective automotive business process systems	3
H/503/4161	303	Lead a team in an automotive environment	3
M/502/6452	406	Knowledge in conducting diagnostic consultations with customers in motor vehicle environments	4

Unit accreditation number	City & Guilds unit number	Unit title	Credit value
T/502/6453	407	Competency in conducting diagnostic consultations with customers in motor vehicle environments	4



2 Centre requirements

Approval

There is no fast track approval for this qualification. Existing centres who wish to offer this qualification must use the **standard** Qualification Approval Process.

To offer this qualification, new centres will need to gain both centre and qualification approval. Please refer to the *Centre Manual - Supporting Customer Excellence* for further information.

Centre staff should familiarise themselves with the structure, content and assessment requirements of the qualification before designing a course programme.

Resource requirements

Physical resources and site agreements

Centres must have access to sufficient equipment in the college, training centre or workplace to ensure candidates have the opportunity to cover all of the practical activities.

Centre staffing

Staff delivering this qualification must be able to demonstrate that they meet the following occupational expertise requirements. They should:

- be occupationally competent or technically knowledgeable in the area for which they are delivering training and/or have experience of providing training. This knowledge must be to the same level as the training being delivered
- have recent relevant experience in the specific area they will be assessing
- have credible experience of providing training.

Centre staff may undertake more than one role, eg tutor and assessor or internal verifier, but cannot internally verify their own assessments.

Assessors and Quality Assurers

All assessors must:

- have sufficient and relevant technical/occupational competence in the Unit, at or above the level of the Unit being assessed
- have in depth knowledge of the Qualification or credit based unit evidence requirements
- hold or be working towards a relevant verifier award as specified by the Institute of the Motor Industry. This will include, but not be limited to the Quality Assurance qualifications:
 - Level 3 Award in Assessing Competence in the Work Environment

- Level 3 Certificate in Assessing Vocational Achievement
- SVQ Unit L&D9D Assess workplace competence using direct methods (SCQF Level 7)
- SVQ Unit L&D9DI Assess workplace competence using direct and in-direct methods (SCQF Level 8)
- PDA in Workplace assessment using direct methods (L&D9D) at SCQF Level 7
- PDA in Workplace assessment using direct and in-direct methods (L&D9DI) at SCQF Level 8
- Legacy Assessor units A1, A2 and D32/33 units
- An appropriate equivalent as defined by the IMI, SSC – see ‘Using employers’ in-house training programmes to assess automotive management & Leadership competence based units and qualifications’)
- Assessors working towards a relevant assessor qualification must achieve their qualification within 12 months. Ordinarily, there is a requirement that assessors working towards the assessor qualification must have their assessment decisions confirmed by a qualified assessor
- demonstrate knowledge and understanding of the competencies that a learner is required to demonstrate for the qualification that they are undertaking
- provide evidence of completing 5 days working/job shadowing in industry within their professional area in a 24 month period.
Note: this will be any work based activity conducted within a real working environment and does not apply to assessment activities.
- provide evidence of 30 hours of technical / qualification related CPD within a 12 month period.(This is in addition to working / job shadowing).

All internal Quality Assurers must:

- have in-depth knowledge of the occupational standards and credit based unit evidence requirements
- be occupationally aware of the relevant industry sector being internally verified
- hold or be working towards a relevant verifier award as specified by the Institute of the Motor Industry. This will include, but not be limited to the Quality Assurance qualifications:
 - Level 4 Award in the Internal Quality Assurance of Assessment Processes and Practice
 - Level 4 Certificate in Leading the Internal Quality Assurance of Assessment Processes and Practice
 - SVQ Unit L&D11 Internally monitor and maintain the quality of workplace assessment (SCQF Level 8)
 - PDA in Internal verification of workplace assessment at SCQF Level 8
 - A legacy Internal Verifier unit V1 or D34 unit
 - An appropriate equivalent as defined by the SSC.
 - An appropriate equivalent as defined by the IMI, SSC – see ‘Using employers’ in-house training programmes to assess automotive management & Leadership competence based units and qualifications’)

- verifiers working towards a relevant qualification must achieve their qualification within 12 months. Ordinarily, there is a requirement that IV's working towards the assessor qualification must have their assessment decisions confirmed by a qualified IV.
- provide evidence of CPD totalling not less than 30 hours from within their professional area within a 12 month period.
- demonstrate knowledge and understanding of the quality assurance processes required by the centre and the awarding organisation

Continuing professional development (CPD)

Centres must support their staff to ensure that they have current knowledge of the occupational area, that delivery, mentoring, training, assessment and verification is in line with best practice, and that it takes account of any national or legislative developments.

Learner entry requirements

City & Guilds does not set entry requirements for this qualification. However, centres must ensure that candidates have the potential and opportunity to gain the qualification successfully.

Age restrictions

City & Guilds cannot accept any registrations for learners under 18 as this qualification is not approved for under 18s.



3 Delivering the qualification

Initial assessment and induction

An initial assessment of each candidate should be made before the start of their programme to identify:

- if the learner has any specific training needs,
- support and guidance they may need when working towards their qualification.
- any units they have already completed, or credit they have accumulated which is relevant to the qualification.
- the appropriate type and level of qualification.

We recommend that centres provide an induction programme so the candidate fully understands the requirements of the qualification, their responsibilities as a candidate, and the responsibilities of the centre. This information can be recorded on a learning contract.

Recording documents

Candidates and centres may decide to use a paper-based or electronic method of recording evidence.

City & Guilds endorses several ePortfolio systems, including our own, **Learning Assistant**, an easy-to-use and secure online tool to support and evidence learners' progress towards achieving qualifications. Further details are available at: www.cityandguilds.com/eportfolios.

City & Guilds has developed a set of tracking sheets specifically for this qualification. They are available from the City & Guilds website or can be ordered from Publications.

Although new centres are expected to use these forms, centres may devise or customise alternative forms, which must be approved for use by the external verifier, before they are used by candidates and assessors at the centre.



4 Assessment

Assessment of the qualification

City & Guilds has written the following assessments to use with this qualification:

- Assignments including knowledge questions
- Tracking sheets to produce a portfolio of evidence.

Assessment strategy

Full details of the assessment requirements and the assessment strategy relating to these qualifications can be obtained directly from the Institute of the Motor Industry (IMI) <http://www.motor.org.uk>

Grading

The knowledge units – 301, 401, 403, 405, and 406 will be graded Pass, Merit or Distinction.

Unit	Title	Assessment
301	Automotive safety and legal requirements	Assignment
302	Organise effective automotive business process systems	Portfolio
303	Lead a team in an automotive environment	Portfolio
400	Competency in diagnosing motor vehicle faults where no prescribed process or format is available	Portfolio
401	Knowledge of diagnosing motor vehicle faults where no prescribed process or format is available in motor vehicle environments	Assignment
402	Competency in providing diagnostic equipment and technical information system support in motor vehicle environments	Portfolio
403	Knowledge of providing diagnostic equipment and technical information system support in motor vehicle environments	Assignment
404	Competency in providing technical support and advice to colleagues in motor vehicle environments	Portfolio
405	Knowledge of providing technical support and advice to colleagues in motor vehicle environments	Assignment

Unit	Title	Assessment
406	Knowledge in conducting diagnostic consultations with customers in motor vehicle environments	Assignment
407	Competency in conducting diagnostic consultations with customers in motor vehicle environments	Portfolio



5 Units

Structure of units

These units each have the following:

- City & Guilds reference number
- unit accreditation number
- title
- level
- credit value
- unit aim
- relationship to NOS, other qualifications and frameworks
- endorsement by a sector or other appropriate body
- learning outcomes which are comprised of a number of assessment criteria

Unit 301

Automotive safety and legal requirements

UAN:	A/503/4098
Level:	Level 3
Credit value:	4
GLH:	28
Relationship to NOS:	This unit is linked to MSC Units E6 and B8.
Endorsement by a sector or regulatory body:	This unit is endorsed by IMI, the Sector Skills Council for the automotive retail industry.
Aim:	This unit covers the essential legal knowledge (including Health and Safety) needed by the first line retail automotive manager in their day to day activities.

Learning outcome
The learner will: 1. know the legal requirements for Data Protection in own area of responsibility
Assessment criteria
The learner can: 1.1 explain the aim of current Data Protection legislation 1.2 describe the type of personal information covered by current data protection legislation and how long this data may be kept 1.3 explain how to meet legal requirements in response to a customer request for a copy of information held about them

Learning outcome
The learner will: 2. know the legal requirements and workplace requirements for health and safety in own area of responsibility
Assessment criteria
The learner can: 2.1 explain what is needed to secure a conviction for breaching health and safety legislation 2.2 explain what is meant by 'duty of care' in terms of current health and safety at work legislation 2.3 define the meaning of 'connivance' under current health and safety at work legislation and its significance to management responsibilities 2.4 describe what are deemed to be 'welfare facilities' under current workplace legislation

- | | |
|-----|--|
| 2.5 | describe the legal requirements for the supply of drinking water to staff |
| 2.6 | describe the courses of action to take in respect of damage to the fabric of the workplace |

Learning outcome	
The learner will:	
3.	know the legal requirements for employment in own area of responsibility
Assessment criteria	
The learner can:	
3.1	explain own key responsibilities in respect of current disability discrimination legislation
3.2	describe the legal consequences of being found guilty of discrimination in the workplace and its potential impact on the business
3.3	state the length of employment necessary for staff to gain full employment rights
3.4	describe the legal courses of action to take in response to: <ul style="list-style-type: none"> a. employee requests for time off to deal with an emergency b. requests for time off for doctor's appointments c. break times when short staffed but with a high workload d. contacting staff who are off-sick at home e. sharing information about an individual with the rest of the team f. receiving information about illegal practice
3.5	describe what constitutes an unacceptable management defence at an Employment Tribunal
3.6	describe the potential consequences of breaching employee confidentiality
3.7	describe the types of behaviour that could constitute bullying and harassment in the workplace

Learning outcome	
The learner will:	
4.	know the legal requirements relating to the supply and sale of goods and services in own area of responsibility
Assessment criteria	
The learner can:	
4.1	define the meaning of 'consumers' in terms of current supply of goods and services legislation
4.2	describe what would constitute 'satisfactory quality' within current sale of goods legislation for the goods/services offered in their area of responsibility
4.3	describe the customer's legal rights in respect of the supply of faulty goods/services offered in their area of responsibility

Unit 301 Automotive safety and legal requirements

Supporting information

Candidates will be assessed on the assessment criteria as specified within the unit. The following information has been provided by IMI SSC and is included to support centres in terms of teaching and delivery.

Legal requirements

- a. Data Protection Act
 - Types of data:
 - i. Electronic
 - ii. Paper based
- b. Health and Safety at Work Act 1974
- c. Disability Discrimination Act 1995 and extended in 2006
- d. Human Rights Act 1998
- e. Working time Directive / Regulations 1998, amended in 2003
- f. Employee rights in the workplace
- g. Employment tribunals
- h. Employee confidentiality in the workplace
- i. Bullying and harassment in the workplace
- j. Sale of Goods Act 1979
 - i. The term 'consumers' in relation to the Supply of Goods and Services Act
 - ii. What is meant by satisfactory quality
 - iii. Consumer rights under the Sale of Goods Act.

Evidence requirements

The evidence requirements are shown in full in the assessment documentation.

Unit 302

Organise effective automotive business process systems

UAN:	F/503/4099
Level:	Level 3
Credit value:	3
GLH:	16
Relationship to NOS:	This unit is linked to MSC Units F3, F6 and F12.
Endorsement by a sector or regulatory body:	This unit is endorsed by IMI, the Sector Skills Council for the automotive retail industry.
Aim:	This unit is concerned with organising and operating efficient and effective automotive related systems to improve business performance. It covers the systems that affect customer satisfaction, quality and operational efficiency. The unit also covers the ability to monitor systems, identify areas for improvement and find new ways of operating more productively.

Learning outcome
The learner will: 1. understand the business processes, systems and measures relevant to own area of responsibility
Assessment criteria
The learner can: 1.1 describe what is meant by an 'effective business process' 1.2 explain the purpose of business processes 1.3 explain the methods of, and necessity for, stock/resources management 1.4 define the meaning of terms used to measure stock in own area of responsibility 1.5 explain ways of measuring performance in own area of responsibility 1.6 describe ways of measuring the use of resources in own area of responsibility 1.7 explain indicators of customer satisfaction 1.8 describe ways of monitoring quality in own area of responsibility

Learning outcome

The learner will:

2. be able to maintain systems and processes for ensuring the effectiveness of own area of responsibility

Assessment criteria

The learner can:

- 2.1 follow systems and processes for resource management in own area of responsibility
- 2.2 use systems and processes to ensure operations and personnel achieve the required performance indicators for:
 - a. customer satisfaction
 - b. quality
 - c. productivity
 - d. operational efficiency

Learning outcome

The learner will:

3. be able to evaluate efficiency in own area of responsibility

Assessment criteria

The learner can:

- 3.1 apply relevant monitoring techniques and measures to assess the performance of own area of responsibility
- 3.2 evaluate the information and data gained from monitoring efficiency
- 3.3 identify inefficiencies and inaccuracies in systems and processes

Learning outcome

The learner will:

4. be able to improve the efficiency of existing systems in own area of responsibility

Assessment criteria

The learner can:

- 4.1 act to remedy inefficient operation of systems
- 4.2 find new ways to operate more productively
- 4.3 implement improvements to maintain efficiency and improve performance

Unit 302 Organise effective automotive business process systems

Supporting information

Evidence requirements

The evidence requirements are shown in full in the assessment documentation.

Unit 303

Lead a team in an automotive environment

UAN:	H/503/4161
Level:	Level 3
Credit value:	3
GLH:	13
Relationship to NOS:	This unit is linked to MSC Units B5, D5 and E14.
Endorsement by a sector or regulatory body:	This unit is endorsed by IMI, the Sector Skills Council for the automotive retail industry.
Aim:	This unit is about demonstrating the team leadership qualities required by a first line manager in the area for which they are responsible. The ability to gain the trust and respect of the team is particularly valued.

Learning outcome
The learner will: 1. be able to provide leadership to own team
Assessment criteria
The learner can: 1.1 set the standards, pace and clear direction for the team compatible with the objectives and culture of the business 1.2 build, through own performance and honesty, the trust and respect of the team 1.3 respond to the concerns and views of team members in a way which maintains support for own leadership 1.4 monitor the standard of activities and progress across the team without interfering unnecessarily in team activities 1.5 support team members to take part in planning activities 1.6 agree work objectives with team members which they are able to follow 1.7 develop ways of achieving business results with the support of the team

Unit 303 Lead a team in an automotive environment

Supporting information

Evidence requirements

The evidence requirements are shown in full in the assessment documentation.

Unit 400

Competency in diagnosing motor vehicle faults where no prescribed process or format is available

UAN:	D/502/6446
Level:	Level 4
Credit value:	7
GLH:	33
Relationship to NOS:	This unit is linked to MR14C.
Endorsement by a sector or regulatory body:	This unit is endorsed by IMI, the Sector Skills Council for the automotive retail industry.
Aim:	This unit enables the learner to prove competency in devising and implementing strategies that provide the best course of action to enable accurate diagnosis and repair of faults when the application of standard manufacturer diagnostic procedures has failed to reveal the source and cause of problems.

Learning outcome
The learner will: 1. be able to work safely when diagnosing faults where no prescribed process or format is available
Assessment criteria
The learner can: 1.1 wear suitable personal protective equipment and use suitable vehicle coverings throughout all diagnostic related activities in the workshop 1.2 carry out all diagnostic activities following company and legislative health and safety requirements

Learning outcome
The learner will: 2. be able to use relevant information to carry out the task
Assessment criteria
The learner can: 2.1 select suitable sources of technical information to support vehicle diagnostic and rectification activities including: a. technical data b. diagnostic test procedures 2.2 interpret technical information to support vehicle diagnostic and rectification activities including: a. technical data b. diagnostic test procedures 2.3 use sufficient diagnostic information in a systematic way to enable an accurate diagnosis of the vehicle system fault

Learning outcome
The learner will: 3. be able to use appropriate tools and equipment
Assessment criteria
The learner can: 3.1 select the appropriate tools and equipment necessary for diagnostic and rectification activities 3.2 check that equipment has been calibrated to meet manufacturers' and legal requirements 3.3 use the equipment required, correctly and safely throughout all vehicle diagnostic and rectification activities

Learning outcome
The learner will: 4. be able to carry out vehicle diagnosis, rectification and test activities where no prescribed process or format is available
Assessment criteria
The learner can: 4.1 use diagnostic methods that are relevant to the symptoms presented 4.2 evaluate your assessment of dismantled sub-assemblies and identify their condition and suitability for repair or replacement accurately 4.3 carry out all diagnostic and rectification activities following: a. manufacturers' instructions b. recognised researched repair methods c. workplace procedures d. health and safety requirements 4.4 ensure all repaired and replaced components and units conform to the vehicle operating specification and any legal requirements 4.5 adjust components and units correctly to ensure that they operate

<p>to meet system requirements</p> <p>4.6 demonstrate testing methods that are suitable for assessing the performance of the system rectified</p>

<p>Learning outcome</p> <p>The learner will:</p> <p>5. be able to record information and make suitable recommendations</p>
<p>Assessment criteria</p> <p>The learner can:</p> <p>5.1 produce work records that are accurate, complete and passed to the relevant person(s) promptly in the format required</p> <p>5.2 make suitable and justifiable recommendations for cost effective repairs</p> <p>5.3 identify and report any expected delays in completion to the relevant person(s) promptly in the format required</p> <p>5.4 record and report any additional faults noticed during the course of their work promptly in the format required</p>

Unit 400 **Competency in diagnosing
motor vehicle faults where no
prescribed process or format
is available**

Supporting information

Evidence requirements

The evidence requirements are shown in full in the assessment documentation.

Unit 401

Knowledge of diagnosing motor vehicle faults where no prescribed process or format is available in motor vehicle environments

UAN:	Y/502/6445
Level:	Level 4
Credit value:	5
GLH:	42
Relationship to NOS:	This unit is linked to MR14K.
Endorsement by a sector or regulatory body:	This unit is endorsed by IMI, the Sector Skills Council for the automotive retail industry.
Aim:	This unit enables the learner to develop knowledge and skills to devise and implement strategies that provide the best course of action to enable accurate diagnosis and repair of faults when the application of standard manufacturer diagnostic procedures has failed to reveal the source and cause of problems.

Learning outcome
The learner will: 1. understand where to find, interpret and use sources of information
Assessment criteria
The learner can: 1.1 explain using examples for a specific diagnostic task, where and how to find and interpret sources of information on: a. vehicle specifications including limits, fits and tolerances b. diagnostic test procedures c. vehicle date d. repair procedures 1.2 explain, using examples for a specific diagnostic task, how to evaluate and analyse test results

Learning outcome
The learner will: 2. understand electrical and electronic principles
Assessment criteria
The learner can: 2.1 explain the principles of vehicle electrical and electronic system operation in relation to fault finding on specific systems including: <ul style="list-style-type: none"> a. electrical component function b. electrical inputs/outputs c. voltages d. oscilloscope patterns e. digital systems f. fibre optic systems g. sensors and actuators (inc application) h. multiplexing 2.2 interpret circuit diagrams relating to systems being tested 2.3 explain how vehicle systems interface and interact with each other

Learning outcome
The learner will: 3. understand a selected vehicle system
Assessment criteria
The learner can: 3.1 describe how a selected vehicle system is constructed and operates 3.2 explain how a selected vehicle system is dismantled and reassembled

Learning outcome
The learner will: 4. understand the use of diagnostic and rectification equipment for diagnosing a vehicle system
Assessment criteria
The learner can: 4.1 explain how to prepare and test the accuracy of diagnostic testing equipment 4.2 explain how to use general diagnostic and rectification equipment and where appropriate, specialist repair tools

Learning outcome
The learner will: 5. understand how to diagnose and rectify a vehicle system fault where there is no prescribed process
Assessment criteria
The learner can: 5.1 describe types and causes of vehicle component and unit faults and failures 5.2 justify selection and methodology of diagnostic procedures and processes in order for diagnostic activities to proceed 5.3 explain how to assess faults in vehicle systems 5.4 explain how to carry out rectification activities of faults found in selected vehicle systems

Learning outcome
The learner will: 6. understand the importance of recording information when diagnosing faults
Assessment criteria
The learner can: 6.1 explain the importance of recording: a. diagnostic test results b. fault location c. correction activities d. rectification information

Unit 401 Knowledge of diagnosing motor vehicle faults where no prescribed process or format is available in motor vehicle environments

Supporting information

Candidates will be assessed on the assessment criteria as specified within the unit. The following information has been provided by IMI SSC and is included to support centres in terms of teaching and delivery.

Sources of information are

- a. Paper based
- b. Electronic based

Information found in

- a. workshop area
- b. Office area
- c. Reception area

Be familiar with

- a. P.C. Passwords
- b. Good House keeping

Using specific diagnostic procedures from data which are

- a. Technical Manuals
- b. P.C. based diagnostic information

Adopting logical diagnostic sequence in line with data

Understand the terms

- a. Analyse
- b. Diagnose
- c. Evaluate
- d. Repair procedures
- e. Interpret information
- f. Interpret data
- g. Calibration

Diagnostic equipment

Examples include electronic testing equipment, brake testing equipment, steering geometry equipment, wheel balancing equipment, emission test equipment, measuring instruments, special service tools, charging service stations, noise and vibration detection equipment.

Vehicle types

Any vehicle and can be hybrid, electric or alternative fuelled vehicles, e.g. LPG, Bio ethanol

Vehicle engine area

Engines, cooling systems, Lubrication system, electronic ignition, petrol fuel injection, diesel fuel injection, engine management systems

Transmission and driveline area

Clutch assemblies, clutch operating systems, manual gear boxes, automatic gear boxes (including electronic control), drivelines and hubs and final drive assemblies

Chassis or frame area

Suspension systems, assisted steering systems, non-assisted steering systems, braking systems, ABS/traction control, wheels and tyres, E.S.P. stability systems, bodywork and related areas

Electrical and electronic area

Starting systems, charging system and SMART charging, body electrical systems (including wiring harnesses, lighting systems, auxiliaries, CANBUS systems, fibre optics, laser, vehicle condition and monitoring, comfort and convenience, alarm systems), supplementary restraint systems (SRS), heating and air conditioning systems, climate control, communication equipment, navigation systems and entertainment equipment

Causes of faults are:

- a. mechanical
- b. electrical
- c. electronic
- d. hydraulic

Faults cover the:

- a. vehicle engine area
- b. transmission and driveline area
- c. chassis system area
- d. electrical and electronic units and components area

Diagnostic methods are:

- a. measurement
- b. functional testing
- c. electrical and electronic systems testing

Diagnostic testing is defined as:

- a. Verify the fault
- b. Collect further information
- c. Evaluate the evidence
- d. Carry out further tests in a logical sequence
- e. Rectify the problem
- f. Check all systems

Diagnostic equipment is:

- a. diagnostic and rectification equipment for mechanical systems
- b. diagnostic and rectification equipment for electrical and electronic systems
- c. diagnostic and rectification equipment for hydraulic and fluid systems
- d. specialist repair tools
- e. general workshop equipment

Rectification activities are defined as:

- a. A suitable repair, replacement, re-coding or re-programming that rectifies the fault(s) identified from the diagnostic activities carried out

Unit 402

Competency in providing diagnostic equipment and technical information system support in motor vehicle environments

UAN:	J/502/6456
Level:	Level 4
Credit value:	4
GLH:	24
Relationship to NOS:	This unit is linked to MR17C.
Endorsement by a sector or regulatory body:	This unit is endorsed by IMI, the Sector Skills Council for the automotive retail industry.
Aim:	This unit enables the learner to prove competency required for updating technical information system and diagnostic equipment and for testing and rectifying equipment and system problems.

Learning outcome
The learner will: 1. be able to maintain and update technical information system and diagnostic equipment
Assessment criteria
The learner can: 1.1 install software updates following delivery from the manufacturer 1.2 load software following manufacturers' instructions 1.3 set technical information system and diagnostic equipment configuration options according to manufacturer's specification 1.4 resolve errors during the loading of software within the limits of their responsibility 1.5 advise all relevant people of any new features and changes to the existing/previous functionality of technical information systems and diagnostic equipment 1.6 complete any specified product registration procedures

Learning outcome

The learner will:

2. be able to identify and resolve faults with technical information systems and diagnostic equipment

Assessment criteria

The learner can:

- 2.1 use the self test function(s) on technical information systems and diagnostic equipment to identify the cause and solution of faults and problems
- 2.2 resolve any identified problems in diagnostic equipment and technical information systems using the self test instructions
- 2.3 contact external support services only when the self test function fails to identify the cause and solution to faults and problems
- 2.4 inform the relevant person(s) of any unresolved loading errors and technical information systems and diagnostic equipment problems

Learning outcome

The learner will:

3. be able to inform the relevant people and source alternative technical information systems and diagnostic equipment if it requires repair

Assessment criteria

The learner can:

- 3.1 inform the relevant person(s) if alternative technical information systems and diagnostic equipment is required
- 3.2 inform the relevant person(s) if technical information systems and diagnostic equipment is not available due to being away for repair
- 3.3 source alternative technical information systems and diagnostic equipment if it has failed or is away for repair

Unit 402 **Competency in providing diagnostic equipment and technical information system support in motor vehicle environments**

Supporting information

Evidence requirements

The evidence requirements are shown in full in the assessment documentation.

Unit 403

Knowledge of providing diagnostic equipment and technical information system support in motor vehicle environments

UAN:	L/502/6457
Level:	Level 4
Credit value:	2
GLH:	12
Relationship to NOS:	This unit is linked to MR17K.
Endorsement by a sector or regulatory body:	This unit is endorsed by IMI, the Sector Skills Council for the automotive retail industry.
Aim:	This unit enables the learner to develop the knowledge required for updating technical information system and diagnostic equipment and for testing and rectifying equipment and system problems.

Learning outcome
The learner will: 1. understand workplace and manufacturer procedures associated with using, updating and maintaining technical information systems and diagnostic equipment
Assessment criteria
The learner can: 1.1 summarise workplace procedures for: a. obtaining diagnostic software updates b. loading/installing technical information system and diagnostic equipment software to specified destinations using manufacturer's software loading instructions c. accessing system support services d. understanding and disseminating to colleagues the legal requirements governing the use of software e. ordering and fitting replacement/spare parts to technical information systems and diagnostic equipment f. informing others that a technical/software update has taken place g. completing product registrations h. reporting problems

Learning outcome
The learner will: 2. understand how to maintain and diagnose faults on technical information systems and diagnostic equipment
Assessment criteria
The learner can: 2.1 explain how to solve minor errors in the loading of software onto technical information systems and diagnostic equipment 2.2 explain how to set configuration options on technical information systems and diagnostic equipment that they work on 2.3 clarify when it is best to apply the technical information systems and diagnostic equipment self test function(s) 2.4 describe how to identify faults using the technical information systems and diagnostic equipment self test function(s) 2.5 describe how to resolve problems using the technical information systems and diagnostic equipment self test function(s) and external support services 2.6 describe the types and causes of errors that can arise during loading of software 2.7 explain the need for correct technical information systems and diagnostic equipment configuration settings 2.8 explain why it is important to install software updates promptly

Learning outcome
The learner will: 3. understand the importance of recording information and reporting/advising of changes, faults and failures promptly
Assessment criteria
The learner can: 3.1 explain the importance of recording the version number and issue date of the software and updates used 3.2 explain the importance of reporting faults and failures of technical information system and diagnostic equipment or their software to the relevant person(s) promptly 3.3 explain the importance of promptly advising the relevant person(s) of functionality changes to technical information system and diagnostic equipment

Unit 403 Knowledge of providing diagnostic equipment and technical information system support in motor vehicle environments

Supporting information

Candidates will be assessed on the assessment criteria as specified within the unit. The following information has been provided by IMI SSC and is included to support centres in terms of teaching and delivery.

Workplace procedures for updating and maintaining technical information

- a. Understand your own knowledge and awareness of manufacturers' products
- b. Understand manufacturers updating and maintenance policies & procedures
- c. Be aware of Manufacturer's Registration
- d. Be aware of Manufacturer's warranty
- e. Understand company updating & maintenance policies & procedures
- f. Understand relevant health and safety policies
- g. Understand relevant copy rights policies
- h. Carry out installation checks
- i. Locate data up dates
- j. Check and test equipment
- k. Loading of soft ware
- l. Be aware of setting and configurations
- m. Confirm satisfactory operation of equipment
- n. Advice colleagues of updating
- o. Follow correct sequence
- p. Ensure up dates are promptly installed
- q. Adhere to all legal requirements

Technical and Diagnostic Equipment

- a. Smoke meter
- b. Emissions Tester
- c. Brake roller
- d. Diagnostic scanners
- e. Scopes
- f. Laptops, Desktops, Tablets

Diagnose faults on technical & diagnostic equipment

- a. Be aware of equipment self test
- b. Understand your own knowledge and awareness of basic step by step diagnostic procedures set by
- c. Manufacturer
- d. Company
- e. Be aware of Manufacturer's warranty
- f. Carry out basic visual checks on Electrical cables and fuses
- g. Be aware of physical damage
- h. Electrical cables
- i. Advise colleagues of faults
- j. Loading of soft ware
- k. Be aware of setting and configurations
- l. Comply with health and safety
- m. Speak to colleagues to clarify fault and symptoms

The importance of recording information and faults

- a. Company Time and cost is kept to a minimum
- b. Manufacturer's warranty can be implemented
- c. So correct up dates are used
- d. Advise colleagues promptly of any equipment failure or change
- e. Provide information and guidance
- f. Information can be evaluated

Unit 404

Competency in providing technical support and advice to colleagues in motor vehicle environments

UAN:	K/502/6448
Level:	Level 4
Credit value:	5
GLH:	29
Relationship to NOS:	This unit is linked to MR15C.
Endorsement by a sector or regulatory body:	This unit is endorsed by IMI, the Sector Skills Council for the automotive retail industry.
Aim:	This unit enables the learner to demonstrate the competency of providing a range of up-to-date technical support, information, advice, instruction and briefings to other workshop colleagues to support smooth workshop operation.

Learning outcome
The learner will: 1. be able to provide up-to-date and accessible technical information to colleagues to support workshop operation
Assessment criteria
The learner can: 1.1 provide accessible, up-to-date vehicle technical information for workshop colleagues 1.2 establish and maintain procedures to check that colleagues have the correct technical resources to carry out their work effectively 1.3 identify any additional resources required 1.4 establish and maintain procedures to give ongoing technical advice to colleagues 1.5 respond to requests for technical help 1.6 ensure their support and advice is technically accurate and in line with manufacturer's instructions

Learning outcome

The learner will:

2. be able to provide clear instruction and demonstrations to colleagues to support workshop operation

Assessment criteria

The learner can:

- 2.1 provide colleagues with instruction on product updates and technical tasks
- 2.2 deliver technical instruction and demonstrations in a manner and at a speed appropriate to the individual colleague concerned
- 2.3 provide adequate time to colleagues to consider feedback and give further explanation when appropriate, ensuring that colleagues have fully understood
- 2.4 identify and correct mistakes in a way that supports colleagues' self confidence and offer praise when tasks are performed correctly

Learning outcome

The learner will:

3. be able to check colleagues' work, give effective and positive feedback and support in a cost effective manner

Assessment criteria

The learner can:

- 3.1 select the most effective situation for giving support and advice to colleagues
- 3.2 check the work of colleagues at regular intervals and take prompt action to resolve problems
- 3.3 carry out checks in a cost effective and efficient manner
- 3.4 suggest possible methods for improving the work of colleagues to your manager

Unit 404 **Competency in providing
technical support and advice
to colleagues in motor vehicle
environments**

Supporting information

Evidence requirements

The evidence requirements are shown in full in the assessment documentation.

Unit 405

Knowledge of providing technical support and advice to colleagues in motor vehicle environments

UAN:	M/502/6449
Level:	Level 4
Credit value:	5
GLH:	47
Relationship to NOS:	This unit is linked to MR15K.
Endorsement by a sector or regulatory body:	This unit is endorsed by IMI, the Sector Skills Council for the automotive retail industry.
Aim:	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 outcome
The learner will: 1. understand how to file, present and demonstrate technical information to workshop colleagues
Assessment criteria
The learner can: 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

Learning outcome
The learner will: 2. understand how to check colleagues' work, give effective and positive feedback, advice and guidance
Assessment criteria
The learner can: 2.1 describe methods of effectively checking colleagues' work 2.2 state the best action to take when a colleague's 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 distinguish between ways of giving advice and guidance which are appropriate to individual colleagues that are being supported 2.5 explain what might happen if a colleague's self confidence is undermined when correcting mistakes 2.6 explain the importance of liaising with their manager when evaluating colleagues' work and giving feedback

Learning outcome
The learner will: 3. understand how to recognise a training need and the importance of continuous development and learning
Assessment criteria
The learner can: 3.1 describe methods and techniques used to recognise training needs in colleagues 3.2 explain the importance of continuous development and learning

Unit 405 Knowledge of providing technical support and advice to colleagues in motor vehicle environments

Supporting information

Candidates will be assessed on the assessment criteria as specified within the unit. The following information has been provided by IMI SSC and is included to support centres in terms of teaching and delivery.

Explain how to file and store technical information effectively
Technical information should be stored:

- a. Tidily
- b. Logically
- c. Securely
- d. Comply with company health and safety, data and copy rights policies

Filed technical information should be:

- a. Computer based
- b. Paper based
- c. Electronic Files should have back up facilities i.e. hard copies or discs.

Presentations demonstrations and methods:

- a. One to one basis
- b. Group basis
- c. Formal (workshop or appropriate workplace area)
- d. Informal (workshop or appropriate workplace area)

Effective techniques:

- a. Determine individual support needs
- b. Inclusiveness: Be supportive towards all individuals
- c. Ensure interruptions and distractions are kept to a minimum
- d. The importance of correct location and timing
- e. Avoid embarrassment of individuals
- f. logical step by step process
- g. Check and assess learner understanding throughout

Identify any preparation work necessary for:

- a. Yourself
 - i. tools
 - ii. equipment
 - iii. workshop manuals etc
- b. The learner
 - i. pen
 - ii. paper

- iii. notes etc
- c. Rehearse demonstrations, instructions and presentations
- d. Identify health and safety risks or hazards
- e. Individuals must be at ease and comfortable with in the learning environment
- f. Emphasise safe working practices
- g. Emphasise logical and systematic technical approach.
- h. Interaction between individuals.
- i. Provide encouragement and understanding throughout

Methods of checking colleagues work:

- a. Direct observation of colleagues
- b. Indirect observation of colleagues
- c. Effective questioning for technical understanding
- d. Third party statements from colleagues supervisor and customers
- e. Provide encouragement and understanding
- f. Positively praise achievement
- g. Correct individual errors
- h. Show empathy and leadership
- i. Provide ongoing advice and support
- j. Carry out skills analysis to identify skills gaps
- k. Photographic or digital imaging for training purposes
- l. Electronically recorded discussion or similar
- m. Feedback must always be positive and constructive, oral or written
- n. Feedback should be recorded for further use
- o. Avoid embarrassment of colleagues
- p. Ensure interruptions and distractions are kept to a minimum
- q. The importance of correct location and timing

The importance of liaising with managers and supervisors:

- a. Analyses of training requirements of colleagues **which may lead to:**
- b. Further in-house training (demonstrations and presentations)
- c. Manufacturers courses
- d. Individual coaching
- e. Individual mentoring

Recognising training needs through:

- a. Analysing individual workplace performance through observations
- b. Analysing how regular individuals ask for assistance
- c. Analysing how regular individuals ask for advice
- d. Analysing inability to use relevant equipment
- e. Analysing inability to diagnose system faults
- f. Analysing failure to carry out work to recognised company/ industrial standards
- g. Failure to complete task in required time
- h. Analysing customer complaints

The importance of continuous development and learning:

- a. Improve task time
- b. Improve practical techniques
- c. Reduce customer complaints

- d. Improve performance with further in-house training
- e. Improve standards with further manufacturers courses
- f. Improve standards with individual coaching
- g. Improve performance with individual mentoring
- h. Continuous discussion and encouragement with individuals to improve self-esteem.

Unit 406

Knowledge in conducting diagnostic consultations with customers in motor vehicle environments

UAN:	M/502/6452
Level:	Level 4
Credit value:	4
GLH:	27
Relationship to NOS:	This unit is linked to MR18K.
Endorsement by a sector or regulatory body:	This unit is endorsed by IMI, the Sector Skills Council for the automotive retail industry.
Aim:	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 outcome
The learner will: 1. understand how to communicate effectively with customers, offer good customer care and present themselves in a suitable and professional manner
Assessment criteria
The learner can: 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 state their workplace requirements for personal appearance and conduct when dealing with customers

Unit 406 Knowledge in Conducting Diagnostic Consultations with Customers in Motor Vehicle Environments

Supporting information

Candidates will be assessed on the assessment criteria as specified within the unit. The following information has been provided by IMI SSC and is included to support centres in terms of teaching and delivery.

Definition of customer in this unit

- a. Operator
- b. Driver
- c. Transport manager
- d. Service receptionist
- e. Diagnostic technician
- f. Any other appropriate person

Communicate effectively by

- a. Recognising the importance customer greetings
- b. Selecting an appropriate location to meet customers
 - i. Office
 - ii. Reception
 - iii. Workshop
 - iv. Showroom
- c. Using effective listening skills
- d. Using appropriate gestures
- e. Being polite
- f. Being clear
- g. Being empathetic
- h. Having appropriate tone of speech
- i. Having appropriate pace of communication

Different customer reactions

- a. Anger
- b. Apprehension
- c. Confusion
- d. Frustration
- e. Nervousness

Handle them effectively by

- a. Recognising the Importance of arguments and viewpoints of others
- b. Responding appropriately and effectively
- c. Distinguishing factual from non-factual information
- d. Providing factual information
- e. Avoiding confrontations
- f. Deciding appropriate action to deal effectively
- g. CARP technique

Adapting effective technical language by

- a. Providing clear simplified explanations of
 - i. Data
 - ii. Terminology
- b. Communication must be clear
- c. Appropriate tone of speech
- d. Appropriate pace of communication

Questioning techniques

- a. Open vs. closed questions
- b. Leading questions
- c. Identifying links

Question customers to

- a. Clarify vehicle fault and symptoms
- b. Clarify sequence of events leading up to fault and symptoms
- c. Clarify recent repairs that may be relevant
- d. Evaluate information provided by customer
- e. Identify possible connection between information an fault

Customer care, concerns and satisfaction

- a. Using appropriate techniques for different scenarios such as
- b. Anger
- c. Apprehension
- d. Confusion
- e. Frustration
- f. Nervousness
- g. Always remain calm
- h. Always be polite
- i. Must have appropriate tone of speech
- j. Must have appropriate pace of communication
- k. Good body language
- l. Recognising the importance customer greetings
- m. Select an appropriate location to meet customers

Recognise when to seek further advice from

- a. Manager/ supervisor
- b. Resolve customer problems and concerns effectively and quickly
- c. Identify improvements to performance

Workplace requirements for personal appearance and conduct.

- a. Understand organisational requirements policy
- b. Understand the equal opportunities policy such as
 - i. Sexual discrimination
 - ii. Racial discrimination
- c. Understand knowledge and awareness of manufacturers' products

Unit 407

Competency in conducting diagnostic consultations with customers in motor vehicle environments

UAN:	T/502/6453
Level:	Level 4
Credit value:	4
GLH:	23
Relationship to NOS:	This unit is linked to MR18C.
Endorsement by a sector or regulatory body:	This unit is endorsed by IMI, the Sector Skills Council for the automotive retail industry.
Aim:	This unit enables the learner to prove they have the competency 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 outcome
The learner will: 1. be able to respond to customer concerns in a positive, effective and professional way
Assessment criteria
The learner can: 1.1 respond to customer concerns in a positive, effective and friendly manner 1.2 give a positive and professional impression of themselves when dealing with customers 1.3 suggest possible methods to improve the customer care process where necessary

Learning outcome
The learner will: 2. be able to gather and record sufficient information to resolve customer concerns and problems
Assessment criteria
The learner can: 2.1 obtain sufficient, detailed information to resolve customer concerns and problems using suitably structured questioning 2.2 where appropriate, carry out a road test to obtain further detailed information and clarification of customers concerns 2.3 create customer consultation and repair records that are complete, accurate and in a suitable format which are signed by the customer where necessary

Learning outcome
The learner will: 3. be able to provide customers with accurate, current and relevant information, advice and guidance where appropriate
Assessment criteria
The learner can: 3.1 provide customers with accurate, current and relevant advice and information on any further investigation(s) needed 3.2 explain to customers the implications of any investigation(s) that may be needed 3.3 give customers technical advice and information accurately, clearly and in a form and manner that the customer will understand 3.4 provide customers with clear and relevant recommendations for the next course of action 3.5 liaise with the customer and other relevant persons to provide clear recommendations and to agree the next course of action 3.6 explain to customers the action that has been taken regarding their vehicle

Unit 407 Competency in conducting diagnostic consultations with customers in motor vehicle environments

Supporting information

Evidence requirements

The evidence requirements are shown in full in the assessment documentation.



Appendix 1 Sources of general information

The following documents contain essential information for centres delivering City & Guilds qualifications. They should be referred to in conjunction with this handbook. To download the documents and to find other useful documents, go to the **Centres and Training Providers homepage** on www.cityandguilds.com.

Centre Manual - Supporting Customer Excellence contains detailed information about the processes which must be followed and requirements which must be met for a centre to achieve 'approved centre' status, or to offer a particular qualification, as well as updates and good practice exemplars for City & Guilds assessment and policy issues. Specifically, the document includes sections on:

- The centre and qualification approval process
- Assessment, internal quality assurance and examination roles at the centre
- Registration and certification of candidates
- Non-compliance
- Complaints and appeals
- Equal opportunities
- Data protection
- Management systems
- Maintaining records
- Assessment
- Internal quality assurance
- External quality assurance.

Our Quality Assurance Requirements encompasses all of the relevant requirements of key regulatory documents such as:

- Regulatory Arrangements for the Qualifications and Credit Framework (2008)
- SQA Awarding Body Criteria (2007)
- NVQ Code of Practice (2006)

and sets out the criteria that centres should adhere to pre and post centre and qualification approval.

Access to Assessment & Qualifications provides full details of the arrangements that may be made to facilitate access to assessments and qualifications for candidates who are eligible for adjustments in assessment.

The **centre homepage** section of the City & Guilds website also contains useful information such on such things as:

- **Walled Garden:** how to register and certificate candidates on line
- **Qualifications and Credit Framework (QCF):** general guidance about the QCF and how qualifications will change, as well as information on the IT systems needed and FAQs
- **Events:** dates and information on the latest Centre events
- **Online assessment:** how to register for GOLA/e-volve assessments.

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Useful contacts

UK learners General qualification information	T: +44 (0)844 543 0033 E: learnersupport@cityandguilds.com
International learners General qualification information	T: +44 (0)844 543 0033 F: +44 (0)20 7294 2413 E: intcg@cityandguilds.com
Centres Exam entries, Certificates, Registrations/enrolment, Invoices, Missing or late exam materials, Nominal roll reports, Results	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 E: centresupport@cityandguilds.com
Single subject qualifications Exam entries, Results, Certification, Missing or late exam materials, Incorrect exam papers, Forms request (BB, results entry), Exam date and time change	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 F: +44 (0)20 7294 2404 (BB forms) E: singlesubjects@cityandguilds.com
International awards Results, Entries, Enrolments, Invoices, Missing or late exam materials, Nominal roll reports	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 E: intops@cityandguilds.com
Walled Garden Re-issue of password or username, Technical problems, Entries, Results, e-assessment, Navigation, User/menu option, Problems	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 E: walledgarden@cityandguilds.com
Employer Employer solutions, Mapping, Accreditation, Development Skills, Consultancy	T: +44 (0)121 503 8993 E: business@cityandguilds.com
Publications Logbooks, Centre documents, Forms, Free literature	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413

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