# City & Guilds Level 3 Vehicle Damage Mechanical, Electrical and Trim Technician (9323-12)

**9323-301 Vehicle Damage Mechanical, Electrical and Trim Technician**

**Sample multiple-choice knowledge test**

**v1-0 April 2022**

**Candidate instructions:**

Please indicate your chosen answer (A, B, C or D) on the corresponding answer sheet.

**Duration**: 90 minutes

**No of questions**: 60

**Grading:**

Pass: 48 (80%)

Distinction: 56 (93%)

**Permitted materials:**

- Pen
- Paper
- Calculator

01

Brake fluid is known to be hygroscopic. What does this term mean?

a) When exposed to the atmosphere it absorbs moisture.
b) It has an extremely high boiling point.
c) The fluid contains water for cooling properties.
d) Viscosity increases as fluid temperature rises.

02

When observing the position of an engine, it looks higher at one end and vibration noise can be heard which worsens when moving away. What is the **most** likely cause?

a) Front suspension springs are weak or cracked.
b) The exhaust is touching the body or chassis
c) Engine mountings are worn or damaged.
d) The gearbox main shaft bearing is excessively worn.

03

What component is **most likely** to be damaged if an engine develops a fault that causes excessive unburnt fuel to pass into the exhaust system?

a) Gas temperature sensor.
b) Silencer
c) Lambda sensor.
d) Catalytic converter.

04

When an intercooler has become damaged, what other component will be effected if it is not replaced?

a) Water pump
b) Turbocharger.
c) Air conditioning compressor.
d) Radiator.

05

In relation to a rear-wheel-drive vehicle, what final drive component is **directly** connected to the propshaft?

a) Pinion.
b) Crown wheel
c) Planet gear.
d) Sun gear.

06

What is the **most** likely consequence of replacing a single worn front wishbone rather than replacing both sides?

a) The vehicle body will lean towards the side with the new component.
b) During acceleration or heavy braking the vehicle will pull to one side.
c) The braking performance on the worn side will be significantly reduced.
d) The steering wheel position will need adjusting to the straight-ahead position.

07

What is the **most** likely effect of failing to replace worn brake pad shims when overhauling front brakes?

a) Steering judder.
b) Disc scoring.
c) Abnormal noises.
d) A spongy feel to the brakes.

08

What steering geometry angle enables steered wheels to return the straight-ahead position after they have been turned?

a) Camber angle.
b) Trust angle.
c) Included angle.
d) Caster angle.

09

The front axle of a vehicle has tyres which are marked as 215/55 R 16 100 H and 215/55 R 16 100 V. What important information **must** be documented and reported?

a) There is a difference in the load index.
b) Aspect ratios differ between the two.
c) Speed ratings are different.
d) The tyre diameters are not the same.

10

In a vehicle electrical system, what is the function of a capacitor?

a) To store and discharge electrical power.
b) It steps up the voltage of a 12 Volt battery.
c) To convert electricity from DC to AC current.
d) It allows current to flow in one direction only.

11

What passive safety system provides pedestrian protection?

a) Under bonnet clearance.
b) Autonomous braking.
c) Anti-lock braking.
d) Driver alert warning.

12

What is the **most** likely root cause of a supplementary restraint system component accidently being deployed?

a) Vibration and movement form the repair process.
b) The battery is connected and all circuits are live.
c) Failure to research the systems and repair method.
d) Unforeseen faults within the vehicle safety systems.

13

What is the **main** reason for checking if there are any trouble/fault codes present, before replacing an airbag?

a) The process ensures they are erased before fitting new parts.
b) To ensure other, less obvious parts have not deployed.
c) Codes must be logged before isolating the vehicle.
d) To check the same codes are not present after fitting.

14

Why are radar sensors primarily used in vehicle advanced driver assistance systems (ADAS)?

a) Monitor air pressure.
b) Recognise pedestrians.
c) To measure distance.
d) Transmit software updates.

15

When mobile, a clicking noise can be heard when the vehicle is turning nearside corners, what is the **most** likely cause of this?

a) Worn wheel bearing.
b) Faulty steering coupling.
c) Bent plunge joint.
d) Worn constant velocity joint.

16

What is the **most** appropriate method of feeding a wiring harness and rear screen washer pipes through a replacement tailgate?

a) Attach a length of welding wire.
b) Attach a draw/fishing wire.
c) Get assistance from a colleague.
d) Coat with a lubricant to reduce drag.

17

What task requires the use of plastic pry bars?

a) Door card removal.
b) Bonded screen removal.
c) Panel gap setting.
d) Ball joint splitting.

18

When tapping a damaged steel thread, why **must** the tap be turned in the opposite direction after a few revolutions?

a) Reversing direction aids with cooling.
b) To prevent damage and breaking of the tap.
c) So the thread is cut in both directions.
d) To allow lubricant to flow down the flutes of the tap.

19

What is the basic, visible difference between a Pozi-drive screwdriver and a Philips screwdriver?

a) The Pozi-drive screwdriver has a blunt tip.
b) The Pozi-drive screwdriver has a sharp tip.
c) The Pozi-drive screwdriver has flat bladed end.
d) The Pozi-drive screwdriver tip is splined.

20

After removing fixings, what is the **best** tool to remove a stubborn windscreen wiper from the spindle of the motor?

a) Flat screwdriver.
b) Pry bar.
c) An arm puller.
d) Vice grips.

21

After the arms of a two-post lift have been positioned at appropriate underbody points, what process **must** take place immediately?

a) Extend the pads to their maximum reach.
b) Use the ‘arm-locks’ to hold them in position.
c) Use chocks to wedge the arms in position.
d) Raise the vehicle and check it is secure.

22

What equipment is **most** appropriate for gaining access to the European On-Board Diagnostics (EOBD) pins so individual circuits can be tested?

a) Multimeter.
b) Oscilloscope.
c) Breakout box.
d) Power probe.

23

What equipment incorporates a target panel, laser centreline and radar reflectors?

a) Advanced Driver Assistance System calibration.
b) Wheel balancing.
c) Headlight alignment.
d) Four-wheel alignment.

24

What device can measure amplitude, frequency and time intervals of electrical circuits?

a) Breakout box.
b) Multimeter.
c) Fault code reader.
d) Oscilloscope.

25

What is the advantage of a cloud-based vehicle diagnostic system?

a) Vehicle owners can access the system.
b) The latest versions are available at all times.
c) Vehicles do not have to be 'plugged in' to the system.
d) Any vehicle electrical faults are rectified by the system.

26

On a vehicle with front end damage, what procedures **must** be carried out to assess the steering before performing a geometry/alignment check?

a) Operate the steering lock to lock to check for abnormal noises, with the wheels on the ground.
b) Test drive to assess the handling and steering characteristics.
c) Check for free-play in the suspension and bearings.
d) Raise the wheels and assess the feel, from lock to lock.

27

What information will be gained from manually spinning road wheels when the vehicle is raised?

a) Buckling of the wheels.
b) Excessive play in suspension bushes.
c) Excessive play in the wheel bearings.
d) Faulty brake sensors.

28

A customer has reported that there is a dashboard warning light illuminated and the brake pedal judders when braking at low speeds. Logically, where is it **best to start** the diagnostic process?

a) Front brake discs and pads.
b) Master cylinder and servo unit.
c) Anti-lock braking sensor and ring.
d) Braking booster and control module.

29

When carrying out electrical diagnostic tests, what is the **best** method of connecting test leads to component plug connectors?

a) Remove the plug and probe the connections.
b) Splice into the wire insulation.
c) Probe or connect at the back of the plug.
d) Probe through the wire insulation with a pin.

30

A technical data sheet in a researched repair states that the front door to front wing has a specified panel gap of 4.0mm, plus or minus (+ -) 1.0mm. What measurement is within this tolerance?

a) 6.0mm.
b) 2.5mm.
c) 5.5mm.
d) 4.5mm.

31

What is the **most** appropriate method of transporting a removed airbag to the designated storage area?

a) Carry it with the cover pointed away from the body.
b) Place it on a trolley or hand truck and push it to the storage area.
c) Secure it with straps and carry it with the cover pointing downwards.
d) Carry it under the arm and apply light pressure to the cover.

32

Legally, what **must** be adhered to when storing vehicle airbags in the workplace?

a) Manual Handling Regulations.
b) Explosive Regulations.
c) Electricity at Work Regulations.
d) Health and Safety at Work Act.

33

Where is the **most** accurate information regarding the location of all supplementary restraint systems on specific vehicles?

a) Vehicle manufacturers' specification list.
b) Owners’ handbook.
c) Researched repair methods.
d) Information labels marked on interior trim.

34

What is the **most** likely consequence of generating shocks and vibration when working near a crash sensor?

a) The vehicle will register a fault code.
b) Loosen connections on the sensor.
c) Pyrotechnic components will deploy.
d) Airbags will not operate.

35

After isolating a circuit containing supplementary restraint system components, why are waiting times stated by vehicle manufacturers' before carrying out diagnostic testing?

a) To allow capacitors to discharge
b) So trouble codes are given time to update.
c) It ensures components are reset.
d) So diodes in the circuits are drained of voltage.

36

What is the **main** function of the overflow valve in a common rail diesel fuel system?

a) Provide a reduction in fuel pressure from the tank to the manifold.
b) To equally distribute fuel between all the injectors.
c) To recirculate excess fuel back into the engine manifold.
d) It returns excess fuel to the fuel tank.

37

What action **must** be taken prior to loosening a connection within the fuel line of a multi-point petrol injection system?

a) Drain the fuel tank.
b) Release the fuel pressure.
c) Remove the fuel pump relay.
d) Disconnect the ‘positive’ lead on the battery.

38

What is the **main** function of the fuel pressure regulator in a compressed natural gas fuel system?

a) To vary fuel pressure according to engine demand/load.
b) To increase fuel line pressure.
c) To allow fuel to be manually shut off.
d) To reduce the high tank pressure to low pressure.

39

What is the **most** likely effect of a kinked diesel fuel supply pipe?

a) Insufficient fuel will prevent the engine running correctly.
b) Excessive pressure build up in the fuel rail causing overfueling.
c) The high pressure pump will be starved and seize.
d) The fuel tank will become pressurised and activate the relief valve.

40

A technician is being electrocuted when working on an electric vehicle which cannot be isolated quickly. What **immediate** action **must** be taken?

a) Push or pull them away with a metal object.
b) Use their clothing to pull them away from the electrical source.
c) Stand on a rubber mat and pull them away with a wooden pole or crook.
d) Move the vehicle away from the technician.

41

What electric vehicle component converts Direct Current (DC) from the battery to Alternating Current (AC) to drive the electric motors?

a) Inverter.
b) Controller.
c) DC/DC converter.
d) Voltage quality module.

42

In reference to an electric vehicle, what is the function of the manual service disconnect component?

a) Isolate all systems in the event of any type of collision.
b) Isolate the 12 Volt auxiliary battery only.
c) Provide a charging port to 'plug in' the vehicle.
d) To enable quick isolation of the high voltage system.

43

What guidelines contain information relating to working on high voltage vehicles?

a) Maintaining Electrical Equipment.
b) Electricity at Work.
c) General Safety.
d) Health and Safety at Work.

44

What is the **best** method of preventing electric vehicles that operate with a keyless remote/fob from being re-energized?

a) Isolate the 12 Volt circuit.
b) Remove the battery from the keyless remote.
c) Place the vehicle in 'ready' mode.
d) Place the fob at a specified distance from the vehicle.

45

How is the speed of an electric vehicle controlled?

a) By varying energy to the motor or motors.
b) The number of driving motors in use changes.
c) Motor polarity alters according to accelerator position.
d) Sensors determine if the high voltage or low voltage battery provides the power.

46

In an electric vehicle, what regenerates energy to be stored in the high-voltage battery?

a) An alternator.
b) Normal driving.
c) Braking.
d) The driving motors.

47

An electric vehicle motor has a specification of 80kW. What does this numerical figure refer to?

a) The power needed to operate the motor.
b) Maximum output of the motor.
c) Minimum output of the motor.
d) The maximum torque of the motor.

48

Which vehicle bus system is used to connect sensors and actuators in door modules and air-conditioning?

a) Ethernet.
b) Controller Area Network (CAN).
c) FlexRay.
d) Local Interconnected Network (LIN).

49

On a vehicle with Advanced Driver Assistance Systems (ADAS), why **must** the system be calibrated after a front windscreen has been replaced?

a) So cameras are aligned and view the road.
b) To check the windscreen is seated correctly.
c) It resets the pedestrian airbags.
d) To allow the system to 'recognise' the new windscreen.

50

What is reduced by using Controller Area Networks (CAN), Wi-Fi and Ethernet in vehicles?

a) The risk of cyberattack.
b) Software updates.
c) Electronic Control Units (ECUs).
d) Cable weight.

51

Within Electronic Control Unit (ECU) software, what is referred to as a 'label'?

a) The version number.
b) Each physical data value.
c) Memory capacity.
d) The electrical waveform it produces.

52

What letter would start the fault code if there was a malfunction with systems that contain telematics?

a) C.
b) B.
c) P.
d) U.

53

What is the function of a transmitter in a vehicle which incorporates telematics?

a) Store data.
b) Amplify signals.
c) Broadcast data.
d) Receive radio signals.

54

What information is sent to vehicle systems by a gyro sensor?

a) Rotational motion.
b) Network signal speeds.
c) Temperature.
d) Bluetooth paring.

55

What method is used to update software when the vehicle is mobile?

a) Bluetooth.
b) Wi-Fi.
c) Ethernet.
d) Satellites.

56

Where is the **most** accurate first aid information for bodyshop products obtained?

a) First aider.
b) Technical Data Sheet.
c) On the product label.
d) Material Safety Data Sheet.

57

Before fitting a large bonnet, what assessment **must** be made?

a) The time it will take to fit it.
b) If assistance is required.
c) How to grip the panel securely.
d) How to align it accurately.

58

When is it **most** important for a technician to know vehicle laden and unladen weights?

a) Lifting vehicles.
b) Test driving.
c) Ordering parts.
d) Aligning headlamps.

59

What guidelines directly relate to managing exposure limits of technicians?

a) Personal Protective Equipment Regulations (PPE).
b) Health and Safety at Work Act (HASAWA).
c) Workplace (Health, Safety and Welfare) Regulations.
d) Control of Substances Hazardous to Health (COSHH).

60

What markings **must** be visible on lifting equipment?

a) The date of the last inspection.
b) Safe working load.
c) Safe working practices.
d) Maintenance log.

**END OF QUESTIONS**

**9323-12** **9323-301 Vehicle Damage Mechanical, Electrical and Trim Technician - Answer sheet**

A City & Guilds Group Business

| Candidate | | Date | |
|---|---|---|---|

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