

National Apprenticeship - Occupational Profile

Craft Occupation Motor Mechanics

Industry Served The Motor Industry

Profile of Craft The work of a Motor Mechanic involves the servicing, maintenance and fault diagnosis of automobile and light commercial vehicle mechanical and electrical systems, vehicle component removal, installation or repair according to original manufacturers' specification.

At the end of the apprenticeship, the craftsperson will be able to demonstrate competence in the following skills:

Core Skills

Servicing

Read, interpret and carry out manufacturers' instructions for all vehicle service, maintenance and repair procedures. Complete a vehicle report form.

Fgas

Describe the overall aim of Regulation No. 842/2006 of the European Parliament and of the Council of 17 of May 2006 in relation to the air conditioning systems of automotive vehicles (MACs). List the dangers to personal health and related safety regulations related to the refrigerant gas contained in mobile air conditioning (MAC) systems. Describe the location of possible leaks of refrigerant gas from an automotive air con unit.

Engine

Diagnose faults, dismantle and reassemble the engine and its ancillary components. Replace timing belts and chains. Use all recommended bolt tightening procedures.

Electrical

Read and interpret relevant electrical wiring diagrams. Use fault-code reader to interrogate ECU memory and OBD system. Employ a logical and structured fault diagnosis methodology (use of diagnostic flow charts). Measure and interpret quantities of electrical current, voltage and resistance. Diagnose/resolve faults in starter, charging and lighting circuits. Remove/replace vehicle lighting components. Align headlamps.

Fuel/Ignition

Diagnose and resolve faults in electronically controlled fuel, ignition and emissions control systems. Evaluate exhaust emission levels with reference to NCT/DoT VTM test requirements.

Transmission

Diagnose faults in manual transmission units. Remove/refit manual transmission units. Diagnose faults in clutch assemblies. Remove/replace clutch components. Remove/replace driveshaft joints and bearings.

Brakes

Diagnose mechanical and hydraulic faults in the braking system. Remove/replace brake components. Employ manufacturers' recommended service and bleeding procedures.

Core Skills (cont'd)

Steering/Suspension

Diagnose faults in steering and suspension systems.
Remove/replace steering and suspension components.
Align suspension and steering geometry.
Balance wheels. Repair punctures.

Bodywork

Remove/replace bodywork components
e.g. door locks, windows and regulators.

Specialist Skills

Engine

Carry out complete engine overhaul on automobile and light commercial vehicle petrol and diesel engines.

Electrical

Check operation of, diagnose any faults present, and return to original manufacturers' specification: standard, multi-voltage and high voltage systems, inter-control module communication systems e.g. CAN, LIN, VAN and MOST networks, multiplex wiring, climate control, cruise control, theft deterrence systems, comfort systems e.g. electric windows and seat/steering adjustment, sunroof, and central locking.

Fuel systems

Check operation of, diagnose any faults present, and return to original manufacturers' specification: high pressure petrol injection systems (e.g. GDI and MED-Motronic) and high pressure diesel injection systems (e.g. common-rail).

Transmission

Check operation of, diagnose any faults present, overhaul and return to original manufacturers' specification: manual, automatic or hybrid transmission assemblies.

Brakes

Check operation of, diagnose any faults present, and return to original manufacturers' specification: ABS and EHB (Electro-Hydraulic Braking) systems. This includes ESP (Electronic Stability Program), TCS (Traction Control System), and ACC (Adaptive Cruise Control) systems.

Occupant safety

Examine, diagnose any faults present, and return to original manufacturers' specification: vehicle occupant passive safety systems. This includes airbag, belt tensioner and rollover protection systems.

Communication and Information

Check operation of, diagnose any faults present, and return to original manufacturers' specification: In-Car Entertainment systems, telecommunication systems, vehicle information systems e.g. technical monitoring displays and GPS (Global Positioning System).

Mobile Air Conditioning (MAC) systems.

Discuss and demonstrate best practice for handling of Fgases storage cylinders, the safe recovery and disposal of Fgas. Perform full servicing of an air conditioning system of a motor vehicle to include: leak detection, recovery, vacuum and refill.

Specialist Skills (cont'd)

Bodywork

Examine bodywork/chassis/tow hitches in compliance with manufacturers' and NCT/DoT VTM specifications.

Common Skills

Servicing

Read, interpret and carry out manufacturers' instructions for all vehicle service, maintenance and repair procedures. Complete a vehicle report form.

NCT/DoT VTM

Determine the condition of automotive vehicles to NCT/DoT VTM requirements.

Engine

Diagnose faults and return to original manufacturers' specification: petrol and diesel engines and their ancillary components.

Electrical

Read and interpret relevant electrical wiring diagrams. Use fault-code reader to interrogate ECU memory and OBD system. Employ a logical and structured fault diagnosis methodology (use of diagnostic flow charts). Measure and interpret quantities of electrical current, voltage and resistance. Diagnose/resolve faults in starter, charging and lighting circuits. Remove/replace vehicle lighting components. Align headlamps.

Transmission

Diagnose faults and return to original manufacturers' specification: clutch system components, driveshafts and bearings.

Brakes

Diagnose faults and return to original manufacturers' specification: brake friction linings.

Steering

Diagnose faults and return to original manufacturers' specification: steering linkage and geometry settings.

Bodywork

Remove/replace bodywork components e.g. door locks, windows and regulators.