Overview

This unit is about identifying electronic enhancements, vehicle electronic security systems and vehicle tracking systems for vehicle types to ensure that the vehicle enhancement meets the specification and functionality of the vehicle and also correctly installing those products to ensure that the vehicle systems function correctly after installation.
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Identify suitability, installation and configuration of vehicle enhancements and vehicle security systems

Performance criteria

You must be able to:

P1 identify which vehicle electronic enhancement products meet the customers requirements and will also integrate fully with the vehicle factory fit electronic systems

P2 support the identification of suitable vehicle enhancement installations, by reviewing vehicle:
   P2.1 vehicle technical data
   P2.2 diagnostic test procedures
   P2.3 customer requirements
   P2.4 electrical component technical data

P3 wear suitable personal protective equipment and use suitable vehicle protection throughout all enhancement activities

P4 prepare and test all the tools and equipment required, following manufacturers' instructions, prior to use

P5 fit vehicle enhancement components which are compatible with the vehicle specification and customer requirements

P6 carry out all electrical enhancement activities following:
   P6.1 manufacturers' instructions
   P6.2 your workplace procedures
   P6.3 health and safety requirements
   P6.4 legal requirements

P7 work in a way which minimises the risk of:
   P7.1 damage to other vehicle systems
   P7.2 damage to other components and units
   P7.3 contact with leakages
   P7.4 contact with hazardous substances

P8 when necessary, adjust the components fitted and vehicle systems correctly (including any reconfiguration of electronic systems) to ensure that they meet the manufacturer’s specification for effective operation

P9 ensure all vehicle enhancements made to the vehicle function to its specification

P10 ensure that all vehicle systems function correctly prior to release to the customer

P11 complete all enhancement activities within the agreed timescale

P12 report any anticipated delays in completion to the relevant person(s) promptly

P13 if there are any issues with the vehicle enhancement liaise with other relevant person(s) (or with the customer) to agree the next course of action

P14 your records are complete, accurate, in the format required and signed
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by the customer, when necessary

P15 when appropriate, explain to customers any action that has been taken regarding their vehicle in non technical terms to give a clear understanding of the work carried out
Knowledge and understanding

You need to know and understand:

**Legislative and organisational requirements and procedures**
- K1 the health and safety legislation and workplace procedures relevant to workshop practices and personal and vehicle protection when enhancing vehicle systems
- K2 legal requirements relating to the vehicle (including road safety requirements)
- K3 your workplace procedures for
  - K3.1 recording fault location and correction activities
  - K3.2 reporting the results of tests
  - K3.3 the referral of problems
  - K3.4 reporting delays to the completion of work
- K4 the importance of working to recognised procedures and processes and obtaining the correct information for enhancement activities to proceed and how to formulate and construct procedures and processes in order for enhancement activities to proceed
- K5 the importance of, documenting installation and enhancement information
- K6 the importance of working to agreed timescales and keeping others informed of progress
- K7 the relationship between time, costs and profitability
- K8 the importance of reporting anticipated delays to the relevant person(s) promptly

**Electrical and electronic principles**
- K9 electrical and electronic principles, including Ohms Law, voltage, power, current (AC/DC) resistance, magnetism, electromagnetism and electromagnetic induction, digital and fibre optics principles
- K10 electrical symbols, units and terms
- K11 electrical safety procedures
- K12 how electrical and electronic units and components operate, including electrical component function, electrical inputs, outputs, voltages/current levels and their associated patterns/waveforms
- K13 the interaction between electrical, electronic and mechanical components within the systems defined
- K14 how electrical systems interlink and interact, including multiplexing
- K15 the functionality of the electrical and electronic systems for electric, hybrid and alternative fuel vehicles
- K16 how installed electronic enhancements interact with factory fit electronic components, including networking systems
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Use of electrical testing equipment
K17  how to prepare and test the accuracy of diagnostic testing equipment
K18  how to use **electrical and electronic testing equipment** to correctly and safely test electrical and electronic systems
K19  how to find, interpret and use sources of information on electrical operating specifications and legal requirements
K20  how to use dedicated and computer based equipment to configure vehicle electronic controlled systems to operate correctly within legal requirements
K21  how to prepare and reconfigure electronically controlled vehicle enhancement systems to allow them to function correctly with factory fit vehicle systems
K22  how to rectify electrical and electronic faults, in standard and enhanced / modified systems
K23  how to make suitable adjustments to components and units
Additional Information

**Scope/range related to performance criteria**

1. **Electronic enhancements may be within**
   1.1. audio systems
   1.2. visual systems
   1.3. communication systems
   1.4. networking systems
   1.5. body electric systems
   1.6. data logging
   1.7. safety systems
   1.8. lighting systems
   1.9. tow bar electrical systems
   1.10. auxiliary power supplies
   1.11. telematics / vehicle location systems
   1.12. electronic security systems

2. **Electronic Security Systems may be**
   2.1. alarm systems
   2.2. immobiliser systems
   2.3. location / tracking systems
   2.4. electronic deadlocking systems

3. **Electrical and electronic testing equipment** covers:
   3.1. volt meters
   3.2. ammeters
   3.3. ohmmeters
   3.4. multimeters
   3.5. dedicated and computer based diagnostic equipment
   3.6. oscilloscopes

4. **Tools and equipment:**
   4.1. hand tools
   4.2. special purpose tools
   4.3. general workshop equipment
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Glossary

**Agreed timescales:**
Examples include: manufacturer's recommended work times, job times set by your company or a job time agreed with a specific customer

**Vehicles:**
These can be any of the following – light vehicles, commercial vehicles, motorcycles, mopeds and scooters
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