

---

## Overview

This NOS is about removing and replacing units and components previously identified as faulty or damaged or where the customer has requested replacements. It is also about evaluating the performance of replaced units and components.

The units and components concerned are not those replaced as part of normal routine vehicle maintenance.

---

## Performance criteria

- You must be able to:*
- P1 use suitable personal and vehicle protective equipment throughout all removal and replacement activities
  - P2 support your removal and replacement activities by reviewing:
    - P2.1 vehicle technical data
    - P2.2 removal and replacement procedures
    - P2.3 legal requirements
  - P3 prepare, check and use all the **equipment** required following manufacturers' instructions
  - P4 prepare the vehicle systems and work area for safe working procedures, as appropriate to the vehicle
  - P5 carry out all removal and replacement activities following;
    - P5.1 manufacturers' instructions
    - P5.2 your workplace procedures
    - P5.3 health, safety and environmental requirements
  - P6 work in a way which minimises the risk of:
    - P6.1 damage to other vehicle systems
    - P6.2 damage to other vehicle components and units
    - P6.3 contact with leakage
    - P6.4 contact with hazardous substances
  - P7 ensure replacement electrical auxiliary units and components conform to the vehicle operating specification and any legal requirements
  - P8 record and report any additional faults you notice during the course of your work promptly
  - P9 use suitable **testing methods** to evaluate the performance of the reassembled system accurately
  - P10 ensure the reassembled system performs to the vehicle operating specification and meets any legal requirements prior to return to the customer
  - P11 ensure your records are accurate, complete and passed to the relevant person(s) within the agreed timescale and in the format required
  - P12 complete all removal and replacement activities within the agreed timescale
  - P13 report any expected delays in completion to the relevant person(s) promptly

## Knowledge and understanding

*You need to know and understand:*

### **Legislative and organisational requirements and procedures**

K1 the legal requirements relating to the vehicle (including road safety and refrigerant handling, fuel storage, high voltage or other requirements)

K2 the legislation and workplace procedures relevant to

K2.1 health and safety

K2.2 the environment (including waste disposal)

K2.3 appropriate personal and vehicle protective equipment

K3 the importance of documenting removal and replacement information

K4 the importance of working to agreed timescales and keeping others informed of progress

K5 the relationship between time and costs

K6 the importance of reporting anticipated delays to the relevant person(s) promptly

### **Use of technical information**

K7 how to find, interpret and use sources of information applicable to electrical units and component removal and replacement

K8 the importance of using the correct sources of technical information

K9 the purpose of and how to use identification codes

### **Electrical auxiliary system operation and construction**

K10 how **electrical units and components** are constructed, removed and replaced for the classification of vehicle worked upon

K11 how **electrical units and components** operate for the classification of vehicle worked upon

### **Equipment**

K12 how to prepare, check and use all the removal and replacement **equipment** required

## Electrical and electronic principles

K13 vehicle earthing principles and earthing methods

K14 electrical and electronic principles associated with electrical systems, including types of sensors and actuators, their application and operation

K15 types of circuit protection and why these are necessary

K16 electrical safety procedures

K17 how lighting and warning circuits work

K18 electric symbols, units and terms

K19 electrical/electronic control system principles

K20 the hazards associated with working on or near high energy electrical vehicle components

## Electrical units and component removal and replacement

K21 how to remove and replace **electrical units and components** for the classification of vehicle worked upon

K22 how to test and evaluate the performance of replacement **electrical units and components** and the reassembled system against the vehicle operating specifications and any legal requirements

K23 the relationship between **testing methods** and the **electrical units and components** replaced – the use of appropriate test methods

K24 the manufacturer's specification for the type and quality of **electrical units and components** to be used

K25 how to work safely avoiding damage to other vehicle systems, components and units and contact with leakage and hazardous substances

---

**Scope/range**

**1. Equipment is**

- 1.1. hand tools
- 1.2. special workshop tools
- 1.3. general workshop equipment
- 1.4. electrical testing equipment

**2. Testing methods are:**

- 2.1. visual
- 2.2. aural
- 2.3. functional
- 2.4. measurement

**3. Electrical units and components are:**

- 3.1. lighting systems
- 3.2. wiper systems
- 3.3. security and alarm systems
- 3.4. comfort and convenience systems (including infotainment and communications)
- 3.5. electric window systems
- 3.6. monitoring and instrumentation systems

---

## Glossary

*This section contains examples and explanations of some of the terms used but does not form part of the standard.*

### **Agreed timescales:**

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

### **Comfort and convenience systems:**

Examples are infotainment and communications, heated seats, electrically adjusted seats, heated screens, electric mirrors, heating, climate control and air conditioning.

### **Units and components:**

Any unit or component from the electrical systems defined in the Scoping Statement above.

### **Vehicles:**

These can be any of the following – light vehicles, commercial vehicles, motorcycles, mopeds and scooters. Additionally, these vehicles may be SI, CI, Hybrid or Alternative fuel vehicles.

### **Alternative fuel:**

This is defined as any type of fuel that may be used to power an internal combustion engine, examples would include LPG, bio ethanol etc.

---

<b>Developed by</b>	IMI
<b>Version Number</b>	3
<b>Date Approved</b>	March 2020
<b>Indicative Review Date</b>	March 2024
<b>Validity</b>	Current
<b>Status</b>	Original
<b>Originating Organisation</b>	IMI Ltd
<b>Original URN</b>	LV03
<b>Relevant Occupations</b>	Engineering; Vehicle Trades; Light Vehicle Service Technician (Automotive)
<b>Suite</b>	Maintenance and Repair - Light Vehicle
<b>Keywords</b>	Electrical; units; components; remove; replace; light; lighting; alarms; wipers; electrics

---