# Inspect, test and replace motor vehicle batteries and related components



**Overview** 

This standard is about carrying out tests to identify faulty batteries, then the removal and replacement of them.

N.B.: This unit does not include working on high voltage battery packs.



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#### **Performance**

#### criteria

- You must be able to: P1 select and use suitable personal protective equipment and vehicle coverings throughout all battery and component testing and replacement activities
  - P2 work in a way which minimises the risk of damage to the vehicle and its systems
  - P3 carry out tests on batteries and components relevant to the faults reported
  - P4 conduct all testing and replacement activities following:
    - P4.1 vehicle, equipment and component manufacturers' recommendation
    - P4.2 your workplace procedures
    - P4.3 health and safety requirements
  - ensure your **testing techniques** clearly identify the type of battery or charging system fault(s)
  - P6 make clear and suitable recommendations for further action based upon the results of your inspection to the relevant person(s)
  - P7 carry out removal and replacement activities using:
    - P7.1 suitable tools and equipment
    - P7.2 the correct techniques
    - P7.3 suitable replacement batteries and components
  - P8 ensure that the replacement battery and charging system function correctly prior to releasing the vehicle to the customer
  - P9 dispose of removed batteries safely to comply with current legal requirements and your workplace procedures
  - P10 store batteries safely to comply with current legal requirements and your workplace procedures
  - P11 complete all testing, inspection and replacement activities within the agreed timescale
  - P12 promptly report any anticipated delays in completion to the relevant person(s)

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# Knowledge and understanding

You need to know and understand:

### Legislative and organisational requirements and procedures

- K1 the current health and safety legislation and workplace procedures relevant to workshop practices and personal and vehicle protection
- K2 the current legal requirements relating to vehicle batteries and components
- K3 your workplace procedures for:
  - K3.1 the referral of problems
  - K3.2 reporting of delays to the completion of work
  - K3.3 personal protection
  - K3.4 storage and maintenance of battery stock
- K4 how to dispose of removed components in line with health and safety and legal requirements
- K5 the importance of disposing of waste safely and the consequences of not doing so to others and the environment
- K6 the importance of storing batteries safely and the consequences of not doing so to others and the environment
- K7 the importance of working to agreed timescales and keeping others informed of progress
- K8 the importance of promptly reporting anticipated delays to the relevant person(s)
- K9 the relationship between time and costs

You need to know and understand:

## **Tools and equipment**

K10 the function and use of diagnostic testing equipment

- K11 the tools and equipment used for replacing batteries and how to select and use them
- K12 how to perform safety and operational checks on tools and equipment
- K13 code saving devices and how and when to use them

You need to know

### **Battery fault finding and replacement**

and understand:

K14 the purpose, function and layout of automotive batteries and charging system, including smart charging

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- K15 battery ratings and the circumstances in which differently rated batteries should be fitted
- K16 the possible faults associated with batteries and charging systems
- K17 fault identification methods and procedures and **testing techniques**associated with **batteries and components** (e.g. visual, use of hand held
  diagnostic equipment, use of battery manufacturer's battery testing equipment)
- K18 how to interpret test results
- K19 the removal and replacement procedures associated with **batteries and components** including electrolyte filling, coding of replacement batteries using
  battery management facility in diagnostic tool and health and safety
  requirements
- K20 how to check that replacement **batteries and components** are of the correct type and quality for the vehicle
- K21 how to inspect, replace and adjust drive belt tension (manual and automatic adjustment) as required
- K22 how to check that **batteries and components** are functioning correctly, referring to manufacturers' procedures, and the importance of doing so before release to the customer
- K23 how to work safely avoiding injury to yourself, to others and damage to vehicles
- K24 the implications of electrical conductivity through the human body

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# Scope/range

# 1. 1. Batteries and components include:

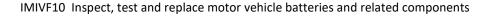
- 1.1. automotive batteries
- 1.2. battery connections
- 1.3. battery supports
- 1.4. battery hold down device
- 1.5. generators
- 1.6. drive belt

# **2. Testing techniques** include:

- 2.1. sensory
- 2.2. functional
- 2.3. electronic

# 3. Tools and equipment include:

- 3.1. hand tools
- 3.2. diagnostic equipment



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# Additional information

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

### **Glossary**

#### Agreed timescales

Examples include job times set by your company or agreed with a specific customer.

#### **Automotive batteries**

Examples include lead-acid, flooded, enhanced-flooded, calcium, absorbed glass mat (AGM), gel filled and low voltage lithium.

### **Diagnostic equipment**

Examples include voltmeter, multimeter, battery test equipment, hydrometer and diagnostic tool

#### **Generators**

These can be alternators, dynamos and electronic components in a high voltage system

### **Vehicles**

These can be light vehicles and light commercial vehicles. These may also include electric/hybrid vehicles.

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