

IMIHV02

Remove and replace large goods and passenger vehicle combustion engine units and components



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Overview

This standard is about removing and replacing large goods and passenger vehicle units and components where dismantling and re-assembly of combustion engine systems is required. It is also about evaluating the performance of replaced units and components. The units and components concerned are those not replaced as part of normal routine, vehicle maintenance (servicing) activities.

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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 the vehicle, vehicle systems and the work area for safe working procedures
- P4 prepare, check and use all the **equipment** required following manufacturers' instructions
- P5 carry out all removal and replacement activities following:
 - P5.1 manufacturers' instructions
 - P5.2 recognised repair methods
 - P5.3 your workplace procedures
 - P5.4 **health, safety and environmental requirements**
- P6 work in a way which minimises the risk of:
 - P6.1 damage to other vehicle systems, units and components
 - P6.2 contact with leakage and hazardous substances
 - P6.3 damage to your work environment
 - P6.4 injury to self and others
- P7 ensure replaced combustion engine **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/driver
- P11 ensure your records are accurate, complete and passed to the relevant person(s) within the agreed timescale 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

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Knowledge and Understanding

You need to know and understand:

Legislative and organisational requirements and procedures

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- K1 the legal requirements (e.g. UK and European Emission Standards) relating to the vehicle (including road safety requirements)
- K2 the implications on an Operators Licence of not carrying out repairs and inspections correctly
- K3 the legislation and workplace procedures relevant to
 - K3.1 health and safety
 - K3.2 the environment (including waste disposal)
 - K3.3 appropriate personal and vehicle protective equipment
- K4 your workplace procedures for
 - K4.1 recording removal and replacement information
 - K4.2 the referral of problems
 - K4.3 reporting delays to the completion of work
- K5 the importance of recording removal and replacement information
- K6 the importance of working to agreed timescales and keeping others informed of progress
- K7 the relationship between time and costs
- K8 the importance of reporting anticipated delays to the relevant person(s) promptly

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You need to know and understand:

Use of technical information

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- K9 how to find, interpret and use sources of information applicable to unit and component removal and replacement within combustion engine systems
- K10 the importance of using the correct sources of technical information
- K11 the purpose of and how to use identification codes

You need to know and understand:

Electrical and electronic principles

- K12 vehicle earthing principles and methods
- K13 electrical and electronic principles associated with vehicle combustion engine systems, including types of sensors, actuators, their application and operation

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- K14 types of circuit protection and why these are necessary
- K15 electrical safety procedures
- K16 how warning, charging and starter circuits work
- K17 electric symbols, units and terms
- K18 battery charging
- K19 electrical/electronic control system principles
- K20 the hazards associated with working on or near high energy electrical vehicle components

You need to know and understand:

Combustion engine system operation and construction

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- K21 how combustion engine systems and their related **units and components** are constructed, dismantled and reassembled for the classification of vehicle worked upon
- K22 how combustion engine systems and their related **units and components** operate for the classification of vehicle worked upon

You need to know and understand:

Equipment

- K23 how to prepare, check and use all the removal and replacement **equipment** required

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You need to know and understand:

Engine unit and component removal and replacement

- K24 how to remove and replace combustion engine system mechanical and electrical **units and components** for the classification of vehicle worked upon
- K25 how to select and fit gaskets, sealants, fittings and fasteners
- K26 how to test and evaluate the performance of replacement combustion engine **units and components** and the reassembled system against the vehicle operating specifications and any legal requirements
- K27 the relationship between **testing methods** and the combustion engine **units and components** replaced – the use of appropriate test methods
- K28 the properties of jointing materials and when and where they should be used

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- K29 the manufacturer's specification for the type and quality of combustion engine **units and components** to be used
- K30 how to work safely avoiding damage to other vehicle systems, components and units and contact with leakage and hazardous substances
- K31 the importance of inspecting the vehicle following any repairs

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Scope/range

1. **Equipment** is, for example:
 - 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. sensory
 - 2.2. functional
 - 2.3. measurement

3. **Unit and components** are:
 - 3.1. mechanical
 - 3.2. electrical

4. **Combustion engine systems** are:
 - 4.1. engine mechanical systems
 - 4.2. cooling, heating and ventilation systems
 - 4.3. air supply and exhaust emission systems
 - 4.4. fuel and ignition systems
 - 4.5. engine electrical and electronic systems
 - 4.6. lubrication systems

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Additional information
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 specific customer.

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Large Goods and Passenger Vehicles:

These are medium and large goods vehicles, buses and coaches of 3500kgs gross vehicle mass (GVM) and above.

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¶ Any unit or component from the engine system as defined in the Scoping Statement above.

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Suite Maintenance and Repair - Large Goods and Passenger Vehicle

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