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Remove and replace light vehicle combustion engine units and components



Overview

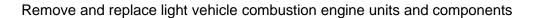
This standard is about removing and replacing units and components where dismantling and re-assembly of combustion engine systems is required. It is also about evaluating the performance of replaced units and components. The units and components concerned are not those replaced as part of normal routine,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



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 systems and work area for safe working procedures as appropriate to the vehicle
 - 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 health, safety and environmental requirements
 - P5.4 your workplace procedures
 - P6 work in a way which minimises the risk of:
 - P6.1 damage to other vehicle systems
 - P6.2 damage to other vehicle units and components
 - P6.3 contact with leakage
 - P6.4 contact with hazardous substances
 - P6.5 damage to your working environment
 - P7 ensure replacement combustion engine **units and components** conform to the vehicle operating specification and any legal requirements
 - P8 promptly record and report any additional faults you notice during the course of your work
 - 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

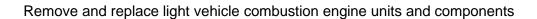
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P12 complete all removal and replacement activities within the agreed timescale

P13 promptly report any expected delays in completion to the relevant person(s)





Knowledge and	Legi	slative and organisational requirements and procedures
understanding		
You need to	K1	the legal requirements relating to the vehicle
know and	K2	the legislation and workplace procedures relevant to:
understand:		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
		progress
	K5	the relationship between time and costs
	K6	the importance of promptly reporting anticipated delays to the relevant person(s)
	Use	of technical information
	K7	how to find, interpret and use sources of information applicable to units and
		component removal and replacement within combustion engine systems
You need to	K8	the importance of using the correct sources of technical information
know and	K9	the purpose of and how to use identification codes
understand:		
	Elec	trical principles
	K10	vehicle earthing principles and earthing methods
	K11	principles associated with vehicle combustion engine systems, including types
		of sensors, actuators, their application and operation
You need to	K12	types of circuit protection and why these are necessary
know and	K13	electrical safety procedures
understand:	K14	how warning circuits work
	K15	electric symbols, units and terms
	K16	battery charging
	K17	electrical/electronic control system principles
	K18	the hazards associated with working on or near high energy electrical vehicle
		components



Combustion engine system operation and construction

- K19 how combustion engine systems and their related units and components are constructed, dismantled and reassembled for the classification of vehicle worked upon
- K20 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

K21 how to prepare, check and use all the removal and replacement **equipment** required

Combustion engine unit and component removal and replacement

You need to	K22	how to remove and replace engine system mechanical and electrical unit
know and		components for the classification of vehicle worked upon
understand:	K23	how to select and fit gaskets, sealants, fittings and fasteners
	K24	how to test and evaluate the performance of replacement engine units and
		components and the reassembled system against the vehicle operating
		specifications and any legal requirements
You need to	K25	the relationship between testing methods and the engine units and
know and		components replaced – the use of appropriate test methods
understand:	K26	the properties of jointing materials and when and where they should be used
	K27	the manufacturer's specification for the type and quality of engine units and
		components to be used
	K28	how to work safely avoiding damage to other vehicle systems, units and
		components and contact with leakage and hazardous substances

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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. sensory
- 2.2. functional
- 2.3. measurement

3. Units 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 systems
- 4.4. fuel and ignition systems
- 4.5. engine electrical 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.

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.

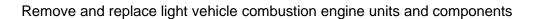
Vehicles

These can be any of the following types of light vehicle: SI, CI, Hybrid, Electric or Alternative fuel vehicles.

Units and components

Any units or component from the engine system as defined in the Scope/Range above.

IMILV02





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