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### Overview

This NOS is about removing and replacing units and components where dismantling and re-assembly of transmission and driveline systems is required. It is also about evaluating the performance of replaced units and components. The units and components concerned are those outside those replaced as part of normal routine, vehicle maintenance (servicing) activities.

## Performance criteria

- You must be able to:
- P1 wear suitable personal protective equipment and use vehicle coverings 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 (where appropriate)
  - P4 prepare, inspect, set up, test 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 and safety 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 components and units
    - P6.3 contact with leakage
    - P6.4 contact with hazardous substances
    - P6.5 damage to your working environment
  - P7 ensure replaced transmission or driveline **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 transmission or driveline 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

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person(s) promptly 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

### Legislative and organisational requirements and procedures

#### You need to know and understand:

- K1 the legal requirements relating to the vehicle
- K2 the legislation and workplace procedures relevant to
  - K2.1 health and safety
  - K2.2 the environment (including waste disposal)
  - K2.3 personal and vehicle protective equipment
- K3 your workplace procedures for:
  - K3.1 recording removal and replacement information
  - K3.2 the referral of problems
  - K3.3 reporting delays to the completion of work
- K4 the importance of documenting removal and replacement information
- K5 the importance of working to agreed timescales and keeping others informed progress
- K6 the relationship between time and costs
- K7 the importance of reporting anticipated delays to the relevant person(s) promptly

### Use of technical information

#### You need to know and understand:

- K8 how to find, interpret and use sources of information applicable to units and component removal and replacement within **transmission and driveline systems**
- K9 the importance of using the correct sources of technical information
- K10 the purpose of and how to use identification codes

### Electrical and electronic principles

#### You need to know and understand:

- K11 vehicle earthing principles and earthing methods
- K12 electrical and electronic principles associated with **transmission and driveline systems**, including types of sensors and actuators, their application and operation
- K13 types of circuit protection and why these are necessary

- K14 electrical safety procedures electric symbols, units and terms
- K15 electrical and electronic control system principles
- K16 the hazards associated with high energy electrical vehicle components

### Transmission and driveline system operation and construction

You need to know and understand:

- K17 how **transmission and driveline systems** and their related **units and components** are constructed, removed and replaced for the classification of vehicle worked upon
- K18 how **transmission and driveline systems** and their related **units and components** operate for the classification of vehicle worked upon

### Equipment

You need to know and understand:

- K19 how to prepare, inspect, test and use all the removal and replacement **equipment** required

### Transmission and driveline system units and components removal and replacement

You need to know and understand:

- K20 how to remove and replace **transmission and driveline system** mechanical, electrical and hydraulic **units and components** for the classification of vehicle worked upon
- K21 how to file, fit, tap, thread, cut and drill plastics and metals
- K22 how to select and use gaskets, sealants, seals, fittings and fasteners
- K23 how to test and evaluate the performance of replacement **transmission and driveline system units and components** and the reassembled system against the vehicle operating specifications and any legal requirements
- K24 the relationship between **testing methods** and the **transmission and driveline system units and components** replaced – the use of appropriate test methods
- K25 when replacement **units and components** must meet the original **equipment** specification (OES) for warranty or other requirements
- K26 how to work safely avoiding damage to other vehicle systems, **units and**

IMILV12

Remove and replace light vehicle transmission and driveline  
units and components



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**components** and contact with leakage and hazardous substances

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**Additional information****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. Units and components are:**
  - 3.1. mechanical
  - 3.2. electrical
  - 3.3. hydraulic
  
- 4. Transmission and driveline systems are:**
  - 4.1. gearbox
  - 4.2. hubs and bearings
  - 4.3. final drive assembly
  - 4.4. driveline components (including propeller shafts and drive shafts)
  - 4.5. clutch

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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.

**Units and components:**

Any unit or component from the transmission and driveline systems defined in the Scoping Statement above.

**Functional testing:**

Examples include: use of brake roller tester, chassis dynamometer, transmission stall test.

**Vehicles:**

These can be any of the following – light vehicles. Additionally these vehicles may be SI, CI, Hybrid, Electric 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.

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