IMIHV08

Diagnose and rectify large goods and passenger vehicle chassis system faults

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Overview

This standard is about diagnosing and rectifying faults occurring within large goods and passenger vehicle steering and suspension systems, braking systems and oth systems fitted to commercial vehicle chassis.

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You must be able to:

P1 use suitable personal and vehicle protective equipment when using **diagnos methods** and carrying out **rectification activities**

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Deleted: and use vehicle coverings (where appropriate)

P2 support the identification of **faults**, by reviewing vehicle:

P2.1 technical data

P2.2 diagnostic test procedures

P3 prepare the vehicle, vehicle systems and work area for safe working procedures as appropriate to the vehicle and environment

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P4 prepare, connect and test all the required **equipment** following manufacturers' instructions prior to use

P5 use **diagnostic methods** which are relevant to the symptoms presented

P6 collect sufficient diagnostic information in a systematic way to enable an accurate diagnosis of **chassis system faults**

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P7 identify and record any system deviation from acceptable limits

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P8 ensure your assessment of dismantled sub-assemblies, components and units identify their condition and suitability for repair or replacement

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P9 inform the relevant person(s) promptly where repairs are uneconomic or unsatisfactory to perform

P10 use the **equipment** required, correctly and safely throughout all **rectification activities**

P11 carry out all **rectification activities** following:

P11.1 manufacturers' instructions

P11.2 recognised repair methods

P11.3 your workplace procedures

P11.4 health, safety and environmental requirements

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P12 work in a way which minimises the risk of:

Deleted: <#>environmental requirements¶

P12.1 damage to other vehicle systems, units and components

P12.2 contact with leakages and hazardous substances

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P12.3 damage to your working environment

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P12.4 injury to self and others

P13 ensure all repaired and replaced components and units conform to the vehicle operating specification and any legal requirements

P14 adjust components and units correctly to ensure that they operate to meet system requirements, when necessary

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P15 record and report any additional **faults** you notice during the course of work promptly

P16 use testing methods which are suitable for assessing the performance of the system rectified

P17 ensure the rectified **chassis system** performs to the vehicle operating specification and any legal requirements prior to return to the customer/driver

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P18 ensure your records are accurate, complete and passed to the relevant person(s) within the agreed timescales in the format required

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P19 complete all system diagnostic activities within the agreed timescale

P20 report any anticipated delays in completion to the relevant person(s) promptly

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Knowledge and understanding	**Legislative and organisational requirements and procedures**

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You need to know and understand:

K1 the legislation and workplace procedures relevant to
- K1.1 health and safety
- K1.2 the environment (including waste disposal)
- K1.3 appropriate personal and vehicle protective equipment

K2 the implications on an Operators Licence of not carrying out repairs and inspections correctly

K3 legal requirements relating to the vehicle (including road safety requirements)

K4 your workplace procedures for
- K4.1 recording diagnostic and **rectification activities**
- K4.2 the referral of problems
- K4.3 reporting delays to the completion of work

K5 the importance of working to recognised diagnostic and rectification procedures and processes and obtaining the correct information for diagnostic and rectification activities to proceed

K6 the importance of recording diagnostic and rectification information

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K7 the importance of working to agreed timescales and keeping others informed of progress

K8 the relationship between time, costs and productivity

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K9 the importance of reporting anticipated delays to the relevant person(s) promptly

You need to know and understand:

Electrical and electronic principles

K10 electrical and electronic principles associated with **chassis systems**, including types of sensors and actuators, their application and operation

K11 how electrical and electronic **chassis systems** operate, including electrical component function, electrical inputs, outputs, voltages and oscilloscope patterns, digital and fibre optics principles

K12 the interaction between electrical, electronic and mechanical components within vehicle **chassis systems**

K13 electrical symbols, units and terms

K14 the hazards associated with working on or near high voltage electrical vehicle components

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You need to know and understand:

Use of diagnostic and rectification equipment

K15 how to prepare and check the accuracy of diagnostic testing **equipment**

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K16 how to use diagnostic and rectification **equipment** for chassis mechanical, electrical, pneumatic, hydraulic and fluid systems, specialist repair tools and general workshop **equipment**

You need to know and understand:

Chassis faults, their diagnosis and correction

K17 how chassis mechanical, electrical, electronic, pneumatic, hydraulic and fluid systems are constructed, dismantled, reassembled and operate

K18 how chassis mechanical, electrical, electronic, pneumatic, hydraulic and fluid systems are dismantled, reassembled and adjusted to manufacturers' specifications

K19 the types and causes of chassis mechanical, electrical, electronic, pneumatic, hydraulic and fluid system component and unit **faults** and failures

K20 chassis mechanical, electrical, electronic, pneumatic, hydraulic and fluid component and unit replacement procedures, the circumstances which will necessitate replacement and other possible courses of action

K21 how to find, interpret and use sources of information on chassis electrical and electronic operating specifications, diagnostic test procedures, repair procedures and legal requirements

K22 vehicle operating specifications for limits, fits and tolerances relating to chassis mechanical, electrical, electronic, pneumatic, hydraulic and fluid systems for the vehicle(s) on which you work

K23 how to select the most appropriate diagnostic testing method for the symptoms presented

K24 how to carry out systematic diagnostic testing of chassis mechanical, electrical, electronic, pneumatic, hydraulic and fluid systems using a prescribed process or format

K25 how to assess the condition evident within chassis mechanical, electrical, electronic, pneumatic, hydraulic and fluid components and units

K26 how to interpret test results and vehicle data in order to identify the location and cause of vehicle system **faults**

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K27 how to carry out **rectification activities** in order to correct **faults** in the chas

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mechanical, electrical, electronic, pneumatic, hydraulic and fluid systems

K28 the relationship between test methodology and the **faults** repaired – the use of appropriate testing methods

K29 how to make cost effective recommendations for rectification

K30 the importance of inspecting the vehicle following any repairs

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Scope/range

1. Chassis systems are:

1.1. steering

1.2. suspension

1.3. braking

2. Diagnostic methods are:

2.1. sensory

2.2. measurement

2.3. functional testing

2.4. electrical and electronic systems testing

3. Diagnostic testing is defined as:

3.1. Verify the fault

3.2. Collect further information

3.3. Evaluate the evidence

3.4. Carry out further tests in a logical sequence

3.5. Rectify the problem

3.6. Check all systems

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4. Equipment is:

4.1. diagnostic and rectification equipment for chassis mechanical systems

4.2. diagnostic and rectification equipment for chassis electrical systems

4.3. diagnostic and rectification equipment for chassis hydraulic and fluid systems

4.4. diagnostic and rectification equipment for chassis pneumatic systems

4.5. specialist repair tools

4.6. general workshop equipment

5. Faults are:

5.1. mechanical

5.2. electrical and electronic

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5.3. hydraulic and fluid
5.4. pneumatic

6. Rectification activities are:

6.1. dismantling
6.2. replacement of units and components
6.3. adjustment of units and components
6.4. repairs to wiring and connectors
6.5. re-programming vehicle systems
6.6. reassembly
6.7. functional testing
6.8. repairs to air line and connectors

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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.*

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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.

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Chassis Area:

Suspension systems, assisted steering systems, non-assisted steering systems braking systems, ABS/traction control, wheels and tyres.

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Chassis system faults:

These are faults that require a multistage inspection and a series of test results identify the cause.

Deleted: **Commercial Vehicles:**¶
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These are medium and large goods vehicles of 3500kgs gross vehicle mass (GVM) and above.¶
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Diagnostic information:

This relates to mechanical condition, including wear, run out, pressures, flow, leakage and electrical measurements such as voltage and pulse displays, electronic systems data, including fault codes, sensor measurements and control unit outputs and/or signals.

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These are faults that require a two or more step diagnostic activity using a prescribed process or format to identify the cause.

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Functional testing:

Examples include: brake roller testing, performance testing and road testing where relevant.

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Hydraulic and fluid systems:

Examples are: hydraulic braking systems, hydro-pneumatic suspension systems power steering, hydraulic load handling and or moving systems.

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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.

Pneumatic systems:

Examples are pneumatic braking systems, pneumatic suspension systems, pneumatic control systems.

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Recommendations:

Examples include: servicing, dismantling for further inspection and test, repair a

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replacement.

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