IMIMC08
Diagnose and rectify motorcycle steering, brakes and suspension system faults

Overview

This NOS is about diagnosing and rectifying faults occurring within motorcycle steering, brakes and suspension systems, including wheels and tyres.

In this standard the term ‘motorcycle’ includes motorcycles, scooters, mopeds and motorcycle-derived three-wheel vehicles on which the rider sits. This standard does not cover quad bikes. These are covered by a separate standard.

Performance criteria

You must be able to:

P1 wear suitable personal protective equipment and use vehicle coverings (where applicable) when using **diagnostic methods** and carrying out **rectification activities**

P2 ensure the motorcycle and the work area is safe prior to commencing with any diagnostic or rectification activity

P3 support the identification of **faults** by reviewing motorcycle:

- P3.1 technical data
- P3.2 appropriate diagnostic test procedures

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

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

P6 collect diagnostic information in a systematic way relevant to the diagnostic methods used

P7 collect sufficient diagnostic information to enable an accurate diagnosis of steering, brakes and suspension system **faults**

P8 identify and record any system deviation from acceptable limits accurately

P9 ensure your assessment of dismantled sub-assemblies, components and units identifies their condition and suitability for repair or replacement, accurately

P10 inform the relevant person(s) promptly where repairs are uneconomic or unsatisfactory to perform

P11 use the **equipment** required correctly and safely throughout all **rectification activities**

P12 carry out all **rectification activities** following:

- P12.1 manufacturer's instructions
- P12.2 your workplace procedures
- P12.3 health and safety requirements

P13 work in a way which minimises the risk of:

- P13.1 damage to other motorcycle systems
- P13.2 damage to other components and units
- P13.3 contact with leakages
- P13.4 contact with hazardous substances

P13.5 injury to self and others

P14 ensure all repaired and replaced components and units conform to the manufacturers' operating specification and relevant requirements

P15 when necessary, adjust components and units correctly to ensure that they operate to meet system requirements

P16 record and report any additional **faults** you notice during the course of work promptly

P17 use appropriate testing methods which are suitable for assessing the performance of the rectified system

P18 ensure the steering, brakes or suspension system rectified performs to the motorcycle operating specification and any legal requirements prior to it being returned to the customer

P19 record and report any steering, brakes or suspension systems that do not conform to legal requirements

P20 ensure your records are accurate, complete and passed to the relevant person(s) promptly in the format required

P21 complete all system diagnostic activities within agreed timescales

P22 report any anticipated 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 health and safety legislation, environmental requirements and workplace procedures relevant to workshop practices and personal and motorcycle protection when diagnosing and rectifying steering, brakes and suspension **faults**

K2 legal requirements relating to the motorcycle (including road safety requirements)

K3 your workplace procedures for:

- K3.1 recording diagnostic and rectification activities
- K3.2 the referral of problems
- K3.3 reporting delays to the completion of work

K4 the importance of documenting diagnostic and rectification information

K5 the importance of working to agreed timescales and keeping others informed of progress

K6 the relationship between time, cost and productivity

K7 the importance of reporting anticipated delays to the relevant person(s) promptly

Electrical and electronic principles

K8 electrical and electronic principles associated with steering, brakes and suspension systems, including wheels and tyres, types of sensors and actuators, their application and operation

K9 how electrical and electronic brake and suspension systems operate, including electrical component function, electrical inputs, outputs, voltages, wave forms and digital principles

K10 the interaction between electrical, electronic and mechanical systems and components within motorcycle brake and suspension systems

K11 electrical symbols, units and terms

K12 electrical safety procedures

K13 the hazards associated with high voltage electrical components and systems

Use of diagnostic and rectification equipment

K14 how to select, prepare and test the accuracy of diagnostic testing equipment

K15 how to use diagnostic and rectification equipment, specialist repair tools and general workshop equipment for steering, brakes and suspension mechanical, electrical, hydraulic systems, including wheels and tyres

Steering, brakes and suspension faults, their diagnosis and rectification

K16 how steering, brakes and suspension mechanical (including wheels), electrical, electronic and hydraulic systems are constructed, dismantled, reassembled and operate

K17 the types and causes of steering, brakes and suspension mechanical (including wheels), electrical, electronic and hydraulic system, component and unit **faults** and failures

K18 steering, brakes and suspension mechanical, electrical and hydraulic component and unit replacement procedures, the circumstances which will necessitate replacement and other possible courses of action

K19 how to minimise the likelihood of corrosion when assembling and reassembling motorcycles

K20 how to find, interpret and use sources of information on electrical operating specifications, diagnostic test procedures, repair procedures and legal requirements relating to brake systems

K21 motorcycle operating specifications for limits, fits and tolerances relating to steering, brakes and suspension mechanical, electrical, electronic and hydraulic systems for the motorcycles on which you work

K22 how to select and carry out the appropriate diagnostic testing method

K23 how to assess and interpret results of the condition of components

K24 how to make cost effective recommendations for rectification

K25 the correct choice and applications of lubricants and fluids

K26 how to carry out the rectification activities listed in the Scoping statement for this standard in order to correct faults in the steering, brakes and suspension mechanical, electrical, electronic and hydraulic systems

K27 the relationship between test methodology and the faults rectified – the use of appropriate testing methods

Scope/range

All of the items listed below form part of this National Occupational Standard.

1 **Faults** are with:

1.1. brakes (mechanical)

1.2. brakes (hydraulic)

1.3. brakes (electrical and electronic)

1.4. brakes (servo assist)

1.5. braking efficiency

1.6. steering control

1.7. steering alignment

1.8. suspension (mechanical)

1.9. suspension (hydraulic)

1.10. suspension (electrical and electronic)

1.11. wheels and tyres

2 **Diagnostic and testing methods** are:

2.1. sensory

2.2. measurement

2.3. functional testing

2.4. electrical and electronic systems testing

3 **Equipment** is:

3.1. appropriate diagnostic and rectification equipment for steering, brakes and suspension mechanical systems

3.2. appropriate diagnostic and rectification equipment for steering, brakes and suspension electrical and electronic systems

3.3. appropriate diagnostic and rectification equipment for hydraulic braking systems

3.4. specialist repair tools

3.5. general workshop equipment

4 **Rectification activities** are:

4.1. dismantling

4.2. replacement of units and components

4.3. adjustment of units and components

4.4. repairs to wiring and connectors

4.5. re-programming motorcycle systems

4.6. reassembly

4.7. functional testing

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

Steering, brakes and suspension system faults

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

Diagnostic information

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

Functional testing

Examples include suspension and steering alignment, performance testing and road testing where relevant

Sensory testing

This would include looking, listening, smelling and touching for heat.

Recommendations

Examples include servicing, dismantling for further inspection and test, repair and replacement

Motorcycles

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