IMIMC13
Diagnose and rectify motorcycle transmission and driveline system faults

Overview

This NOS is about diagnosing and rectifying mechanical, hydraulic and electrical/electronic faults occurring within motorcycle gearboxes, clutches, driveline and hubs and bearings.

In this standard the term ‘motorcycle’ includes motorcycles, scooters, mopeds and motorcycle-derived three- or four-wheel vehicles (such as quad bikes) on which the rider sits.

Performance criteria

You must be able to:

P1 wear suitable personal protective equipment and use motorcycle coverings when using **diagnostic methods** and carrying out rectification activities

P2 ensure the motorcycle and the work area is safe prior to commencing work

P3 support the identification of **transmission and driveline faults** by reviewing motorcycle:

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

P4 select, prepare and check 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 logical and systematic way relevant to the diagnostic methods used

P7 collect sufficient diagnostic information to enable an accurate diagnosis of **transmission and driveline 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 diagnostic and **rectification activities** following:

- P12.1 manufacturer's instructions
- P12.2 recognised repair procedures
- P12.3 your workplace procedures
- P12.4 health, safety, and environmental 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 motorcycle operating specification and any legal requirements

P15 adjust components and units correctly, when necessary, 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 testing methods which are suitable for assessing the performance of the system rectified

P18 ensure the rectified **transmission and driveline system** performs to the motorcycle operating specification and any legal requirements prior to returning it to the customer

P19 ensure your records are accurate, complete and passed to the relevant person(s) promptly in the format required

P20 complete all system diagnostic activities within the agreed timescale

P21 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 transmission and driveline system faults

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

K3 your workplace procedures for:

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

K4 the importance of working to recognised diagnostic procedures and processes and obtaining the correct information for diagnostic activities to proceed

K5 the importance of documenting diagnostic and rectification information

K6 the importance of working to agreed timescales and keeping others informed of progress

K7 the relationship between time, costs and profitability

K8 the importance of reporting anticipated delays to the relevant person(s) promptly

Electrical and electronic principles

K9 electrical and electronic principles associated with **transmission and driveline systems**, including types of sensors and actuators, their application and operation

K10 how electrical and electronic **transmission and driveline systems** operate, including electrical component function, electrical inputs, outputs, voltages and oscilloscope patterns, digital and fibre optics principles

K11 the interaction between electrical, electronic and mechanical components within vehicle **transmission and driveline systems**

K12 how transmission and driveline electrical systems interlink and interact, including multiplexing

K13 electrical symbols, units and terms

K14 electrical safety procedures

K15 the hazards associated with working on or near high energy electrical vehicle components

Use of diagnostic and rectification equipment

K16 how to select, prepare and check the accuracy of diagnostic testing equipment

K17 how to use diagnostic and rectification **equipment** for transmission and driveline mechanical and hydraulic systems, specialist repair tools and general workshop equipment

Transmission and driveline system faults, their diagnosis and correction

K18 how motorcycle transmission and driveline mechanical and hydraulic systems are constructed, dismantled, reassembled and operate

K19 the types and causes of motorcycle transmission and driveline mechanical and hydraulic system component and unit faults and failures

K20 transmission and driveline mechanical and hydraulic system 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 transmission and drive system operating specifications, diagnostic test procedures, repair procedures and legal requirements

K22 motorcycle operating specifications for limits, fits and tolerances relating to transmission and driveline mechanical and hydraulic systems for the motorcycle(s) on which you work

K23 how to select and carry out the correct diagnostic testing method

K24 how to assess and interpret results of the condition of components

K25 how to make cost effective recommendations for rectification

K26 how to carry out the rectification activities listed in the Scoping Statement for this unit in order to correct faults in the transmission and driveline mechanical and hydraulic systems

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

Scope/range

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

1 **Transmission and driveline systems** are:

1.1. clutch

1.2. manual gearbox

1.3. automatic and semi-automatic gearbox

1.4. chain and sprockets

1.5. drive shafts

1.6. gear drive

1.7. belts and pulleys

1.8. wheel bearings, hubs and seals

2 **Diagnostic methods** are:

2.1. sensory

2.2. measurement

2.3. functional testing

3 **Diagnostic test procedures** are:

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

4 **Equipment** is:

4.1. diagnostic and rectification equipment for transmission mechanical systems

4.2. specialist repair tools

4.3. general workshop equipment

5 **Faults** are:

5.1. mechanical

5.2. hydraulic

5.3. electrical and electronic

6 **Rectification activities** are:

6.1. dismantling

6.2. replacement of units and components

6.3. adjustment of units and components

6.4. reassembly

6.5. 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

Transmission and driveline 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 and any electrical measurements

Functional diagnostic methods

Examples include performance testing and road testing where relevant

Sensory diagnostic methods

These may include looking, listening, smelling and touching for heat.

Transmission Area

Clutch assemblies, clutch operating systems, gear boxes, drives, hubs and final drive assemblies

Recommendations

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

Motorcycles

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