

## Assessment Requirements

### Unit MC04K – Knowledge of Motorcycle Chassis Units and Components

#### Content:

#### Steering

- a. The action and purpose of steering geometry:
  - i. castor angle
  - ii. trail angle
  - iii. wheel alignment
  
- b. The following terms associated with steering:
  - i. castor angle
  - ii. trail angle
  - iii. rake angle
  - iv. wheel alignment
  
- c. The components and layout of steering systems:
  - i. handlebar
  - ii. conventional steering head
  - iii. leading link
  - iv. bearings
  - v. steering stem
  - vi. yolk
  
- d. The procedures used for inspecting the serviceability and condition of:
  - i. conventional steering head
  - ii. leading link
  
- h. Steering system defects to include:
  - i. uneven tyre wear
  - ii. steering vibrations
  - iii. wear in linkage
  - iv. bearing failure
  - v. damage linkage
  - vi. excessive play
  - vii. incorrect fork alignment
  - viii. ix incorrect steering geometry

#### Suspension

- a. The layout and components of suspension systems:
  - i. conventional telescopic fork and tube
  - ii. upside down telescopic fork and tube
  - iii. hossack/Fior (Duolever) fork
  - iv. springer fork
  - v. leading link
  
- b. The operation of suspension systems and components:
  - i. Convention telescopic fork and tube

- ii. Upside down telescopic fork and tube
  - iii. Hydraulic damper
  - iv. Double swinging arm
  - v. Single swing arm
  - vi. Mono shock
  - vii. Adjustable damper
  - viii. Adjustable spring
- c. The advantages of different systems including:
- i. Convention telescopic fork and tube
  - ii. Upside down telescopic fork and tube
  - iii. Hydraulic damper
  - iv. Double swinging arm
  - v. Single swing arm
  - vi. Mono shock
  - vii. Adjustable damper
  - viii. Adjustable spring
- d. The forces acting on suspension systems during braking, riding and cornering.
- e. The methods of locating the road wheels against braking, driving and cornering forces.
- g. Suspension terms:
- i. rebound
  - ii. bump
  - iii. dive
- h. The procedures used for inspecting the serviceability and condition of the suspension system
- i. Suspension system defects:
- i. wheel hop
  - ii. ride height
  - iii. wear
  - iv. noises under operation
  - v. fluid leakage
  - vi. excessive travel
  - vii. excessive tyre wear
  - viii. poor handling
  - ix. worn dampers
  - x. worn joints
  - xi. damaged linkages

### **Brakes**

- a. The construction and operation of drum brakes:
- i. leading and trailing shoe construction
  - ii. drum designs
  - iii. cable
  - iv. hydraulic
  - v. self-servo action
  - vi. adjustment
- b. The construction and operation of disc brakes:
- i. disc pads
  - ii. calliper
  - iii. brake disc
  - iv. ventilated disc

- v. disc pad retraction
- c. The construction and operation of the hydraulic braking system:
  - i. master cylinders
  - ii. disc brake calliper & pistons
  - iii. brake pipe
  - iv. warning lights
- d. The principles and components of electronic ABS systems, electrical and electronic components.
- e. The requirements and hazards of brake fluid:
  - i. boiling point
  - ii. hygroscopic action
  - iii. manufacturer's change periods
  - iv. fluid classification and rating
  - v. potential to damage paint surfaces
- f. Terms associated with mechanical and hydraulic braking systems:
  - i. braking efficiency
  - ii. brake fade
  - iii. ABS
- g. The procedures used for inspecting the serviceability and condition of the braking system
- h. Braking system defects:
  - i. worn brake shoes or pads
  - ii. worn or scored brake drums
  - iii. worn or scored brake discs
  - iv. abnormal brake noises
  - v. brake judder
  - vi. brake adjustments
  - vii. fluid contamination of brake surfaces
  - viii. antilock brake failure
  - ix. fluid leaks
  - x. poor braking efficiency
  - xi. brake bind
  - xii. brake grab
  - xiii. brake fade

### **Wheel and Tyres**

- a. The construction of different types of tyre:
  - i. radial
  - ii. tread patterns
  - iii. tyre mixing regulations
  - iv. tyre applications
- b. Tyre markings:
  - i. tyre and wheel size markings
  - ii. speed rating
  - iii. direction of rotation
  - iv. profile
  - iv. tread-wear indicators
- c. Wheel construction:
  - i. light alloy
  - ii. wire wheels
  - iii. bearing arrangement
  - iv. roller ball

- v. taper
- d. The procedures used for inspecting the serviceability and condition of:
  - i. tyres & wheels
  - ii. bearings
- e. The defects associated with tyres and wheels:
  - i. abnormal tyre wear
  - ii. cuts
  - iii. side wall damage
  - iv. wheel vibrations

### General

The procedures for dismantling, removal and replacement of motorcycle chassis units, parts and system components

- a. The preparation:
  - i. testing and use of tools and equipment
  - ii. electrical meters and equipment used for dismantling
- b. Appropriate safety precautions:
  - i. PPE
  - ii. vehicle protection when dismantling
  - iii. removing and replacing chassis motorcycle chassis units, parts and system components
- c. The important of logical and systematic processes.
- d. The inspection and testing systems and components.
- e. The preparation of replacement units for re-fitting or replacement of motorcycle chassis units, parts and system components Identify the reasons why replacement components and units must meet the original specifications (OES):
  - i. warranty requirements
  - ii. to maintain performance
  - iii. safety requirements
- f. Refitting procedures.
- g. The inspection and testing of units and systems to ensure compliance with manufacturer's, legal and performance requirements.
- h. The inspection and re-instatement of the vehicle following repair to ensure customer satisfaction:
  - i. cleanliness of motorcycle
  - ii. security of components and fittings
  - iii. re-instatement of components and fittings
- i. construction and operation of motorcycle steering and suspension systems
  - a) conventional steering head
  - b) leading link
  - c) swinging arm
  - d) single swing arm
- j. key engineering principles that are related to motorcycle steering and suspension systems
  - a) steering geometry
  - b). steering angles
  - c) hydraulic damping
  - d). stress and strain

- k. key engineering principles that are related to motorcycle steering and suspension systems
  - a) steering geometry
  - b) steering angles
  - c) hydraulic damping
  - d) stress and strain
  
- l. construction and operation of motorcycle braking systems
  - a) cable
  - b) hydraulic braking
  - c) electronic ABS system
  
- m. key engineering principles that are related to motorcycle braking systems
  - a) laws of friction
  - b) hydraulics
  - c) properties of fluids
  - d) braking efficiency
  
- n. construction and operation of motorcycle wheels and tyres
  - a) tyre construction
  - b) tyre markings
  - c) wheel construction
  
- o. key engineering principles that are related to motorcycle wheel and tyre systems
  - a) friction
  - b) un-sprung weight
  - c) dynamic and static balance