National Occupational Skill Standard (NOSS)

| Occupational Title | : Motorcycle Mechanic |
|--------------------|--------------------------|
| Level | : 2 |
| Sector | : Automobile Engineering |
| Sub - Sector | : Two Wheeler |
| NOSS ID/NSCO ID | : |
| ISCO NO | : |



Council for Technical Education and Vocational Training **NATIONAL SKILL TESTING BOARD** Madhyapur Thimi-17, Sanothimi, Bhaktapur, Nepal



Developed: 14-05-2023 (31-01-2080)

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Approved by the Tripartite National Skill Testing Board 1993





The National Skill Standard and Test was Revised by:

| No. | Name | Designation | Organization | | | |
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| $\neg \land$ | Rec | commended by Automobile | i ecnnicai Sub Committee: J | uly 2015 (Asnad 2072) | 1 | |
| | NOSS ID # Develope | d Date: 2023-05-14 | Revision Number ## | Revised Date: dd/mm/yy | Page:3 | |
| V | | | | | | |



The National Skill Standard and Test was Revised by:

| No. 1. | Name Prof. Rabindra Nath Bhattarai | Designation Coordinator | Organization Automobile Technical Sub Committee National Skill Testing Board (NSTB), Sanothimi, Bhaktapur |
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| 1 | Occupational Title: Motorcycle Mechanic Level: 2 |
|---|---|
| 2 | Job Description: Motorcycle Service Mechanic, L-2 performs periodic maintenance, repairs control system, repairs engine and transmission system, repairs electrical and electronic system of two-wheeler. |
| 3 | UNITS OF COMPETENCY: |
| | 1. Perform periodic maintenance |
| | 2. Repair control system |
| | 3. Repair engine and transmission system |
| | 4. Repair electrical and electronic system |
| | 5. Perform communication |
| | 6. Develop professionalism |
| | *Note: Unit 5 and 6 are not for testing purpose. |
| 4 | Qualifying Notes/Prerequisites: |
| | Physical Requirement: Sound health |
| | Entry Requirement: As per NSTB rules |
| | Additional Information: Assessment Types: Performance Test only |
| | Assessment Duration: 10 to 12 Hrs (Full competency only) |
| | Recommended Group Size: 5 to 7 candidates |
| | |



| Unit No:1 Unit Title: Perform periodic maintenance | | Unit code: | | | |
|---|---|---|--|--|--|
| Elements of competency | | Performance standards | | | |
| 1.1 Propert tools equipment and material | 1.1.1 | Personal protective equipment (PPE) used in accordance with organization standard. | | | |
| 1.1 Prepare tools, equipment and material | 1.1.2 | Tools, equipment and materials checked and collected as per task requirement. | | | |
| | 1.1.3 | Two-wheeler raised on central stand stably. | | | |
| | 1.2.1 | Two-wheeler washed and dried. | | | |
| 1.2 Perform periodic maintenance of | 1.2.2 | Mechanical components inspected visually for defects. | | | |
| | 1.2.3 | Mechanical components disassembled sequentially as per manufacturer's specification | | | |
| | | and components tagged. | | | |
| | 1.2.4 | Mechanical components inspected, cleaned and <i>foreign materials</i> removed. | | | |
| | 1.2.5 | Damaged or worn-out components replaced in specific maintenance interval as per | | | |
| | | service manual. | | | |
| | 1.2.6 | Free play, valve clearance, sparkplug gap and idle RPM adjusted as per service manual. | | | |
| | 1.2.7 | Moving components/pivot points lubricated and all components reassembled | | | |
| | | sequentially as per manufacturer's specification. | | | |
| | 1.2.8 | Chassis fasteners checked and tightened as per specified torque. | | | |
| | 1.2.9 | Performance checked after periodic maintenance as per checklist. | | | |
| | 1.3.1 | Electrical components inspected visually for defects. | | | |
| 1.3 Perform periodic maintenance of electrical | 1.3.2 | Electrical components disassembled sequentially as per manufacturer's specification | | | |
| components | | and components tagged. | | | |
| | 1.3.3 | Electrical parameters measured and verified with manufacturer's specification. | | | |
| | 1.3.4 | Electrical components inspected, cleaned and foreign materials removed. | | | |
| | 1.3.5 | Damaged or worn-out components replaced in specific maintenance interval as per | | | |
| | | service manual. | | | |
| | Unit No:1 Unit Title: Perform periodic maintenance Elements of competency 1.1 Prepare tools, equipment and material 1.2 Perform periodic maintenance of mechanical components 1.3 Perform periodic maintenance of electrical components | Unit No:1 Unit Title: Perform periodic maintenanceElements of competency1.1.11.1Prepare tools, equipment and material1.1.21.11.1.31.2.11.2Perform periodic maintenance of mechanical components1.2.11.2.41.2.31.21.2.41.2.51.2.61.2.71.2.81.31.2.91.3Perform periodic maintenance of electrical components1.3.11.31.31.3.11.31.3.11.31.3.11.31.3.11.31.3.11.31.3.11.31.3.11.31.3.11.31.3.11.31.3.11.31.3.11.31.3.11.31.3.11.31.3.11.31.3.2 | | | |





| | | 1.3.6 Electrical components reassembled sequentially as per manufacturer's specification. |
|---|--|--|
| | | 1.3.7 Head light high-low beam adjusted as per service manual. |
| | | 1.3.8 Performance checked after periodic maintenance as per checklist. |
| | | 1.4.1 <i>Fluid</i> and coolant level and condition checked. |
| | 1.4 Change fluid and coolant | 1.4.2 Engine oil drained completely from a warm engine in a container without spilling. |
| | | 1.4.3 Fluid and coolant drained completely in a container without spilling. |
| | | 1.4.4 Drain plug cleaned and installed with new seal. |
| | | 1.4.5 <i>Specified grade</i> of fluid and coolant filled to specified level. |
| | | 1.4.6 Spilled fluid cleaned from engine. |
| | | 1.5.1 Unused materials collected and stored in designated place. |
| | 1.5 Clean workshop | 1.5.2 Tools and equipment cleaned, checked and stored in designated place. |
| | | 1.5.3 Work area cleaned, wiped and dried. |
| | | 1.5.4 Waste disposed as per <i>3R's principle</i> at designated location. |
| 6 | Task Performance Requirements (Tools, Equipmen | t and Materials): |
| | Two-wheeler, service manual, multi meter | , tachometer, hydrometer, temperature gauge, compression pressure gauge, open and ring |
| | spanner set, socket set, hammer, Allen keys | , pliers, screw drivers, torque wrench, funnel, bleeding tools, tray, container, measuring jar, wire |
| | brush, fork tube opener, grease gun, spark | Sing wrench, spark plug cleaner, reeler gauge, sand paper, on container, tyre pressure gauge, air |
| | can specified grease cloth rags control c | ables kerosene netrol gasket fuel filter cleaning agents water polish brake shoe brake pad |
| | chain sprocket, rear suspension assembly, r | patch, glue, diagnostic tools, dustpan, dustbin, broom, pen, paper, register, job card, first aid kit |
| | | atten, orac, and receive teoris, adorpan, adorbin, broom, pen, paper, register, job data, mot dia kiel |



and personal protective equipment.



| 7 | Safety and Hygiene (Occupational Health and Safety): |
|---|--|
| | Use Personal Protective Equipment (PPE). |
| | Safe handling of tools and equipment. |
| | Avoid slippery floor. |
| | Avoid electrical, chemical and fire hazard. |
| | Safe disposal of waste. |





| | Required Knowledge | | | | | | | |
|---|---|--------------------|------------------------|--|--|--|--|--|
| 8 | Technical Knowledge | Applie | ed Calculation | Graphical Information | | | | |
| | Tools and equipment Use and application Handling technique Safety measures National classification of two-wheeler Two-wheeler Introduction Types Components and their function Fundamentals of: Engine Transmission system Suspension system Steering system Ignition system Lubrication system Cooling system Electrical system Electrical system Types and uses of fluid and coolant Periodic maintenance and servicing Washing and drying procedure Adjustment of components | | | Read and interpret wiring diagram Read and interpret service manual | | | | |
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| | o Types | |
|---|---|--|
| | Operation of fuel system | |
| | Fuel system components | |
| | • Air bleeding | |
| • | Wheel | |
| | Components and their function | |
| | Tyre pressure | |
| • | Diagnostic tools | |
| • | Workshop layout and management | |
| • | Waste management | |
| • | Record keeping | |
| • | Occupational health and safety | |
| • | Importance of first aid kit | |





| 9 | Assessment of Competency | | | | | | | | | | |
|----------|--------------------------|---|---|-----------------|---------------------|------------------|----------------|--|--|--|--|
| | Unit: 1 | | | | | | | | | | |
| | Unit Title: Perform pe | Unit Title: Perform periodic/preventive maintenance | | | | | | | | | |
| | | | Candidate Details | | | Assessors Detail | | | | | |
| | Candidate's Name: | | | Assessors' | Name | | ID/License No: | | | | |
| | Registration Number: | | | 1. | | | | | | | |
| | Symbol No: | | | 2. | | | | | | | |
| | Tost Contro: | | Test Date: | 2 | | | | | | | |
| | Test centre. | | Test Date. | 5. | | | | | | | |
| Elen | Element of competency | | Performance Standards | Standard Met | Standard Not Met | Evidence Type | Comments | | | | |
| | Decession la sla | 1.1.1 | Personal protective equipment (PPE) used in | | | | | | | | |
| 1.1 | Prepare tools, | | accordance with organization standard. | | | | | | | | |
| | material | 1.1.2 | Tools, equipment and materials checked and | | | | | | | | |
| | | | collected as per task requirement. | | | | | | | | |
| | | 1.1.3 | Two-wheeler raised on central stand stably. | | | | | | | | |
| | | 1.2.1 | Two-wheeler washed and dried. | | | | | | | | |
| 1.2 | Perform periodic | 1.2.2 | Mechanical components inspected visually for | | | | | | | | |
| | mechanical | | defects. | | | | | | | | |
| | components 1. | | Mechanical components disassembled sequentially | | | | | | | | |
| | | | as per manufacturer's specification and | | | | | | | | |
| | | | components tagged. | | | | | | | | |
| | | 1.2.4 | Mechanical components inspected, cleaned and | | | | | | | | |
| | | | foreign materials removed. | | | | | | | | |
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| | | 1.2.5 | Damaged or worn-out compo | nents replaced in | | | | | |
|----------|------------------|-------|---------------------------------|-------------------------|----|----------------|--------|---------|--|
| | | | specific maintenance interval | as per service manual. | | | | | |
| | | 1.2.6 | Free play, valve clearance, spa | arkplug gap and idle | | | | | |
| | | | RPM adjusted as per service n | nanual. | | | | | |
| | | 1.2.7 | Moving components/pivot po | ints lubricated and all | | | | | |
| | | | components reassembled seq | uentially as per | | | | | |
| | | | manufacturer's specification. | | | | | | |
| | | 1.2.8 | Chassis fasteners checked and | l tightened as per | | | | | |
| | | | specified torque. | | | | | | |
| | | 1.2.9 | Performance checked after pe | eriodic maintenance as | | | | | |
| | | | per checklist. | | | | | | |
| 1.2 | | 1.3.1 | Electrical components inspect | ted visually for | | | | | |
| 1.3 | Perform periodic | | defects. | | | | | | |
| | electrical | 1.3.2 | Electrical components disasse | mbled sequentially as | | | | | |
| | components | | per manufacturer's specificati | on and components | | | | | |
| | | | tagged. | | | | | | |
| | | 1.3.3 | Electrical parameters measur | ed and verified with | | | | | |
| | | | manufacturer's specification. | | | | | | |
| | | 1.3.4 | Electrical components inspect | ed, cleaned and | | | | | |
| | | | foreign materials removed. | | | | | | |
| | | 1.3.5 | Damaged or worn-out compo | nents replaced in | | | | | |
| | | | specific maintenance interval | as per service manual. | | | | | |
| | | 1.3.6 | Electrical components reasser | nbled sequentially as | | | | | |
| | | | per manufacturer's specificati | on. | | | | | |
| | | 1.3.7 | Head light high-low beam adju | usted as per service | | | | | |
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| | | | manual. | | |
|-----|------------------|-------|---|--|--|
| | | 1.3.8 | Performance checked after periodic maintenance as | | |
| | | | per checklist. | | |
| | | 1.4.1 | Fluid and coolant level and condition checked. | | |
| 1.4 | Change fluid and | 1.4.2 | Engine oil drained completely from a warm engine | | |
| | coolant | | in a container without spilling. | | |
| | | 1.4.3 | Fluid and coolant drained completely in a container | | |
| | | | without spilling. | | |
| | | 1.4.4 | Drain plug cleaned and installed with new seal. | | |
| | | 1.4.5 | Specified grade of fluid and coolant filled to | | |
| | | | specified level. | | |
| | | 1.4.6 | Spilled fluid cleaned from engine. | | |
| | | 1.5.1 | Unused materials collected and stored in | | |
| 1.5 | Clean workshop | | designated place. | | |
| | | 1.5.2 | Tools and equipment cleaned, checked and stored | | |
| | | | in designated place. | | |
| | | 1.5.3 | Work area cleaned, wiped and dried. | | |
| | | 1.5.4 | Waste disposed as per 3R's principle at designated | | |
| | | | location. | | |

| WT- Written Test | OQ - Oral Question | PT- Practical Test | DO – Direct Observation | SR- Supervisor's report | SN –Simulation |
|-----------------------|---------------------------|--------------------|--------------------------------|-----------------------------------|------------------------------|
| RP - Role Play | PG – Photographs | VD- Video | CT – Certificates | TS – Testimonials (Reward) | PP – Product Produced |

CS – Case Study



Range Statement

| Variable | | Range | | |
|--------------------------------------|--|------------------------|---------|-----------------------------|
| Personal protective equipment | May include but not limited to: Helmet Gloves Safety goggles Safety boot Mask Apron | | | |
| Two-wheeler | May include but not limited to: Motorcycle Scooter | | | |
| Mechanical components | May include but not limited to: Fuel line Spark plug Valves Carburettor Air filter element Engine oil filter Rotor filter Oil strainer Clutch Front brake Rear brake Brake lines | | | |
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| | Wheels |
|-------------------|---------------------------------|
| | Wheel bearing |
| | Swing arm |
| | Drive chain and sprockets |
| | Steering bearing |
| | Chassis fasteners |
| | Front fork |
| | Shock absorber assembly |
| | • Injector |
| | Cooling system components |
| | Air induction system components |
| | • V-belt |
| | Control cables |
| Defects | May include but not limited to: |
| | Physical damage |
| | Wear and tear |
| | Malfunction |
| | • Leakage |
| | Breakage |
| | Loosened parts |
| Foreign materials | May include but not limited to: |
| | • Dirt |
| | • Debris |
| | • Rust |
| | Metal particles |





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| | Transmission oil Brake fluid |
|-----------------|--|
| | Fork oil |
| Specified grade | May include but not limited to: • Engine oil • SAE 10W-30 API SJ-SN • SAE 10W-40 API SJ-SN • SAE 15W-50 API SJ-SN • SAE 20W-40 API SJ-SN • Transmission oil • SAE 80W-90 • SAE 85W-120 • Fork oil • 10W • 15W • 20W • Brake fluid |
| | o DOT-3 o DOT-4 |
| 3R's Principle | May include but not limited to: |
| | Reduce |
| | • Reuse |
| | Recycle |





| 5 | Unit No: 2 Unit Title: Repair control system | | Unit code: | | | |
|---|---|-----------------------|---|--|--|--|
| | Elements of competency | Performance standards | | | | |
| | 2.1 Dreneve tools and equipment | 2.1.1 | . Personal protective equipment (PPE) used in accordance with organization standard. | | | |
| | 2.1 Prepare tools and equipment | 2.1.2 | Tools, equipment and materials checked and collected as per task requirement. | | | |
| | | 2.1.3 | Two-wheeler raised on central stand stably. | | | |
| | | 2.2.1 | Suspension system inspected for visible damage. | | | |
| | 2.2 Repair suspension system | 2.2.2 | Fault in suspension system identified through visual inspection and testing. | | | |
| | | 2.2.3 | Suspension system dissembled sequentially as per manufacturer's specification and | | | |
| | | | <i>components</i> tagged. | | | |
| | | 2.2.4 | Components of suspension system inspected, cleaned and <i>foreign materials</i> removed. | | | |
| | | 2.2.5 | 2.2.5 Damaged components replaced with new components of correct specification. | | | |
| | | 2.2.6 | Suspension system reassembled to correct alignment and tightened to manufacturer's | | | |
| | | | specification. | | | |
| | | 2.2.7 | ⁷ Required amount of fork oil refilled to correct level as per manufacturer's specification. | | | |
| | | 2.2.8 | Post repair testing carried out as per the checklist. | | | |
| | | 2.3.1 | Performance of brake system checked as per manufacturer's specification. | | | |
| | 2.3 Repair brake system | 2.3.2 | Fault in brake system identified through visual inspection and testing. | | | |
| | | 2.3.3 | Brake system dissembled sequentially as per manufacturer's specification and | | | |
| | | | components tagged. | | | |
| | | 2.3.4 | Components of brake system inspected, cleaned and foreign materials removed. | | | |
| | | 2.3.5 | Free play checked and adjusted to manufacturer's specification. | | | |
| | | 2.3.6 | Damaged components replaced with new components of correct specification. | | | |
| | | 2.3.7 | ' Required amount of brake fluid refilled to correct level and bleed as per manufacturer's | | | |
| | | | specification. | | | |





| | 2.3.8 | Brake system reassembled to correct alignment and tightened to manufacturer's |
|-------------------------------|-------|---|
| | | specification. |
| | 2.3.9 | Post repair testing carried out as per the checklist. |
| | 2.4.1 | Condition of steering system checked as per manufacturer's specification. |
| 2.4 Repair steering system | 2.4.2 | Fault in steering system identified from visual inspection and testing. |
| | 2.4.3 | Steering system dissembled sequentially as per manufacturer's specification and |
| | | components tagged. |
| | 2.4.4 | Components of steering system inspected, cleaned and foreign materials removed. |
| | 2.4.5 | Damaged components replaced with new components of correct specification. |
| | 2.4.6 | Required components lubricated and steering system reassembled to correct alignment |
| | | and tightened to manufacturer's specification. |
| | 2.4.7 | Post repair testing carried out as per the checklist. |
| | 2.5.1 | Unused materials collected and stored in designated place. |
| 2.5 Store tools and equipment | 2.5.2 | Tools and equipment cleaned, checked and stored in designated place. |
| | 2.5.3 | Work area cleaned, wiped and dried. |
| | 2.5.4 | Waste disposed as per 3R's principle at designated location. |

6 Task Performance Requirements (Tools, Equipment and Materials):

• Two-wheeler, service manual, torque wrench, socket wrench set, oil can, screw driver set, pliers, multi meter, wire cutter, open and ring spanner set, fork tube opener/t-handle, oil seal remover, fork seal puller and installer, measuring container, funnel, measuring tape, lock remover, spring compressor, hammer, air compressor, brake bleeder, measuring cup, brake piston puller, steering race puller/remover, steering race installer, steering stem bearing tool, ring nut wrench, Allen keys, test lamp, suspension system components, brake system components, steering system components, lubricants, fluids, wire brush, emery paper, PVC tape, cloths, rags, cleaning agent, dustbin, dustpan, broom, pen, paper, register, job card, first aid kit and personal protective equipment.





| 7 | Safety and Hygiene (Occupational Health and Safety): |
|---|--|
| | Use Personal Protective Equipment (PPE). |
| | Safe handling of tools and equipment. |
| | Avoid slippery floor. |
| | Avoid electrical, chemical and fire hazard. |
| | Safe disposal of waste. |





| | Required Knowledge | | | | | | | | |
|---------|--|--------------------|---------------------|--------------|------------------------------|-----|--|--|--|
| 8 | Technical Knowledge | A | oplied Calculation | Gra | aphical Information | | | | |
| | Tools and equipment Use and application | | | • Rea mar | d and interpret serv nual | ice | | | |
| | Handling technique Safety measures | | | | | | | | |
| | Control system and components Suspension system Introduction | | | | | | | | |
| | Types of suspension system and working proce Components and their function | ss | | | | | | | |
| | Common problemsRepair and maintenance | | | | | | | | |
| | Braking system Introduction Types of brake system and working process | | | | | | | | |
| | Components and their function Brake problems | | | | | | | | |
| | Brake repair and maintenanceSteering system | | | | | | | | |
| | IntroductionTypes and working process | | | | | | | | |
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| 0 | Components and their function | |
|-------------|-------------------------------|--|
| 0 | Common problems | |
| 0 | Repair and maintenance | |
| • Flui | id and Lubricants | |
| 0 | Introduction | |
| 0 | Types | |
| 0 | Quality and grade | |
| 0 | Level | |
| 0 | Common problems | |
| Occupati | ional health and safety | |
| • Waste m | nanagement | |
| • Record k | keeping | |
| • First aid | kit | |





| 9 | Assessment of Competency | | | | | | | | | |
|------|-----------------------------|---|--|-----------------|---------------------|------------------|----------------|--|--|--|
| | Unit: 2 | | | | | | | | | |
| | Unit Title: Repair cont | Unit Title: Repair control system | | | | | | | | |
| | | | Candidate Details | | | Assessors D | Detail | | | |
| | Candidate's Name: | | | Assessors' | Name | | ID/License No: | | | |
| | Registration Number: | | | 1. | | | | | | |
| | Symbol No: | | | 2. | | | | | | |
| | Test Centre: | Test Centre: Test Date: | | | | | | | | |
| Elei | ment of competency | | Performance Standards | Standard Met | Standard Not Met | Evidence Type | Comments | | | |
| 2.1 | Prepare tools and equipment | 2.1.12.1.22.1.3 | Personal protective equipment (PPE) used in accordance with organization standard. Tools, equipment and materials checked and collected as per task requirement. Two-wheeler raised on central stand stably. | | | | | | | |
| 2.2 | Repair suspension system | 2.2.12.2.22.2.32.2.4 | Suspension system inspected for visible damage or wear. Fault in suspension system identified through <i>visual</i> <i>inspection and testing.</i> Suspension system dissembled sequentially as per manufacturer's specification and <i>components</i> tagged. Components of suspension system inspected, cleaned and <i>foreign materials</i> removed. | | | | | | | |





| | 2.2.5 | Damaged components replaced with new components | | |
|-------------------------|-------|--|--|--|
| | | of correct specification. | | |
| | 2.2.6 | Suspension system reassembled to correct alignment | | |
| | | and tightened to manufacturer's specification. | | |
| | 2.2.7 | Required amount of fork oil refilled to correct level as | | |
| | | per manufacturer's specification. | | |
| | 2.2.8 | Post repair testing carried out as per the checklist. | | |
| | 2.3.1 | Performance of brake system checked as per | | |
| 2.3 Repair brake system | | manufacturer's specification. | | |
| | 2.3.2 | Fault in brake system identified through visual | | |
| | | inspection and testing. | | |
| | 2.3.3 | Brake system dissembled sequentially as per | | |
| | | manufacturer's specification and components tagged. | | |
| | 2.3.4 | Components of brake system inspected, cleaned and | | |
| | | foreign materials removed. | | |
| | 2.3.5 | Free play checked and adjusted to manufacturer's | | |
| | | specification. | | |
| | 2.3.6 | Damaged components replaced with new components | | |
| | | of correct specification. | | |
| | 2.3.7 | Required amount of brake fluid refilled to correct level | | |
| | | and bleed as per manufacturer's specification. | | |
| | 2.3.8 | Brake system reassembled to correct alignment and | | |
| | | tightened to manufacturer's specification. | | |
| | 2.3.9 | Post repair testing carried out as per the checklist. | | |





| | | 2.4.1 | Condition of steering system checked as per | | |
|-----|-----------------|-------|--|--|--|
| 2.4 | Repair steering | | manufacturer's specification. | | |
| | System | 2.4.2 | Fault in steering system identified from visual inspection | | |
| | | | and testing. | | |
| | | 2.4.3 | Steering system dissembled sequentially as per | | |
| | | | manufacturer's specification and components tagged. | | |
| | | 2.4.4 | Components of steering system inspected, cleaned and | | |
| | | | foreign materials removed. | | |
| | | 2.4.5 | Damaged components replaced with new components | | |
| | | | of correct specification. | | |
| | | 2.4.6 | Required components lubricated and steering system | | |
| | | | reassembled to correct alignment and tightened to | | |
| | | | manufacturer's specification. | | |
| | | 2.4.7 | Post repair testing carried out as per the checklist. | | |
| | . | 2.5.1 | Unused materials collected and stored in designated | | |
| 2.5 | Store tools and | | place. | | |
| | equipment | 2.5.2 | Tools and equipment cleaned, checked and stored in | | |
| | | | designated place. | | |
| | | 2.5.3 | Work area cleaned, wiped and dried. | | |
| | | 2.5.4 | Waste disposed as per 3R's principle at designated | | |
| | | | location. | | |

| WT- Written Test | OQ - Oral Question | PT- Practical Test | DO – Direct Observation | SR- Supervisor's report | SN –Simulation | |
|------------------------|---------------------------|--------------------|--------------------------------|-----------------------------------|---------------------------------------|--|
| RP - Role Play | PG – Photographs | VD - Video | CT – Certificates | TS – Testimonials (Reward) | PP – Product Produced | |
| CS – Case Study | | | | | | GTEVA |
| NOSS ID # | Developed I | Date: 2023-05-14 | Revision Number ## | Revised Date: dd/mm/yy | Page:25 | TRADE 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 |
| 1989 | | | | | · · · · · · · · · · · · · · · · · · · | AGLL TEST |

Range Statement

| Variable | Range |
|--------------------------------------|---|
| Personal protective equipment | May include but not limited to: Helmet Gloves Safety goggles Safety boot Mask Apron |
| Two-wheeler | May include but not limited to: • Motorcycle • Scooter |
| Visual inspection and testing | May include but not limited to: • Suspension system • Leakage • Abnormal noise • Wear and tear • Stroke length • Preload • Rebound and compression damping • Alignment • Brake system • Leakage • Abnormal noise • Wear and tear • Fluid level |
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| | • Steering system | |
|------------|--|--|
| | Abnormal noise | |
| | Wear and tear | |
| | Lubrication | |
| | Hard steering | |
| Components | May include but not limited to: | |
| | Suspension system | |
| | Damper rod | |
| | ○ Fork seal | |
| | Dust seal | |
| | Rear suspension | |
| | ○ O-Ring | |
| | Fork spring | |
| | Rebound spring | |
| | Guide bush | |
| | Shock damper bush/bearing | |
| | Shock inner tube | |
| | Shock barrel | |
| | Brake system | |
| | Brake pedal | |
| | Brake master cylinder | |
| | ○ Reservoir | |
| | Brake lines and hoses | |
| | Brake callipers and piston | |
| | Disc brake pads/shoes | |
| | Disc brake rotor/drum | |
| | Wheel speed sensor | |
| | o Union bolt | |
| | Bleeder valve | |
| | Pad spring | |
| \wedge | | |





| | Steering system Steering handle bar Steering stem Steering race bearing kit Dust seal Ring nut |
|-------------------|---|
| Foreign materials | May include but not limited to: Dirt Debris Rust Metal particles |
| 3R's Principle | May include but not limited to: Reduce Reuse Recycle |





| 5 | Unit No: 3 Unit Title: Repair engine and transmission system | | | Unit code: |
|---|---|-------|-----------------|---|
| | Elements of competency | | | Performance standards |
| | 2.1 Dreasons to also and a mismo ant | 3.1.1 | Personal prot | ective equipment (PPE) used in accordance with organization standard. |
| | 3.1 Prepare tools and equipment | 3.1.2 | Tools, equipm | ent and materials checked and collected as per task requirement. |
| | | 3.1.3 | Two-wheeler | raised on central stand stably. |
| | | 3.2.1 | Performance | of engine checked as per manufacturer's specification. |
| | 3.2 Repair engine | 3.2.2 | Fault in engine | e identified through visual inspection and testing. |
| | | 3.2.3 | Engine dissem | bled sequentially as per manufacturer's specification and components |
| | | | tagged. | |
| | | 3.2.4 | Components of | of engine inspected, cleaned and <i>foreign materials</i> removed. |
| | | 3.2.5 | Gap and clear | ance measured and adjusted to manufacturer's specification. |
| | | 3.2.6 | Damaged com | ponents replaced with new components of correct specification. |
| | | 3.2.7 | Moving comp | onents lubricated as per manufacturer's specification. |
| | | 3.2.8 | Engine reasse | mbled with correct alignment and tightened to manufacturer's |
| | | | specification. | |
| | | 3.2.9 | Required amo | unt of engine oil refilled to correct level as per manufacturer's |
| | | | specification. | |
| | | | Post repair tes | sting carried out as per the checklist. |
| | | 3.3.1 | Cooling syster | n inspected as per manufacturer's specification. |
| | 3.3 Repair cooling system | 3.3.2 | Fault in coolin | g system identified through visual inspection and testing. |
| | | 3.3.3 | Cooling syster | n dissembled sequentially as per manufacturer's specification and |
| | | | components t | agged. |
| | | 3.3.4 | Components of | of cooling system inspected, cleaned and foreign materials removed. |
| | | 3.3.5 | Damaged com | ponents replaced with new components of correct specification. |





| | 3.3.6 | Cooling system reassembled to correct alignment and tightened to manufacturer's |
|-----------------------------------|-------|---|
| | | specification. |
| | 3.3.7 | Required amount of coolant refilled to correct level as per manufacturer's specification. |
| | 3.3.8 | Post repair testing carried out as per the checklist. |
| | 3.4.1 | Condition of lubrication system checked as per manufacturer's specification. |
| 3.4 Repair lubrication system | 3.4.2 | Fault in lubrication system identified through visual inspection and testing. |
| | 3.4.3 | Lubrication system dissembled sequentially as per manufacturer's specification and |
| | | components tagged. |
| | 3.4.4 | Components of lubrication system inspected, cleaned and foreign materials removed. |
| | 3.4.5 | Damaged components replaced with new components of correct specification. |
| | 3.4.6 | Lubrication system reassembled to correct alignment and tightened to manufacturer's |
| | | specification. |
| | 3.4.7 | Required amount of engine oil refilled to correct level as per manufacturer's |
| | | specification. |
| | 3.4.8 | Post repair testing carried out as per the checklist. |
| | 3.5.1 | Performance of fuel system checked as per manufacturer's specification. |
| 3.5 Repair carburetor fuel system | 3.5.2 | Fault in fuel system identified through visual inspection and testing. |
| | 3.5.3 | Fuel system dissembled sequentially as per manufacturer's specification and |
| | | components tagged. |
| | 3.5.4 | Components of fuel system inspected, cleaned and foreign materials removed. |
| | 3.5.5 | Damaged components replaced with new components of correct specification. |
| | 3.5.6 | Fuel system reassembled to manufacturer's specification. |
| | 3.5.7 | Carburetor tune-up performed as per manufacturer's specification. |
| | 3.5.8 | Post repair testing carried out as per the checklist. |





| | 2.C. Donoir eluteb unit | | 3.6.1 | Performance of clutch check | ed as per manufacturer's specific | ation. | |
|-----|---|----------------------------|-------|--|---------------------------------------|---------------------|----------|
| | 3.6 Repair clutch u | Init | 3.6.2 | Fault in clutch identified thro | ough visual inspection and testing | ξ . | |
| | | | 3.6.3 | Clutch unit dissembled seque | entially as per manufacturer's spe | ecification and cor | nponents |
| | | | | tagged. | | | |
| | | | 3.6.4 | Clutch components inspected | d, cleaned and foreign materials | removed. | |
| | | | 3.6.5 | Plate thickness and height of | f clutch spring measured and veri | fied with manufac | cturer's |
| | | | | specification. | | | |
| | | | | Damaged components replace | ced with new components of corr | rect specification. | |
| | | | 3.6.7 | Moving components lubricat | ed and clutch components reass | embled to manufa | cturer's |
| | | | | specification. | | | |
| | 3.6.8 Post repair testing carried out as per the checklist. | | | | | | |
| | | | 3.7.1 | Operation of gear box checke | ed as per manufacturer's specific | ation. | |
| | 3.7 Repair gear bo | X | 3.7.2 | Fault in gear box identified the | nrough visual inspection and test | ing. | |
| | | | | Gear box dissembled sequen | tially as per manufacturer's speci | ification and comp | onents |
| | | | | tagged. | | | |
| | | | 3.7.4 | Components of gear box insp | pected, cleaned and foreign mate | rials removed. | |
| | | | 3.7.5 | Damaged components replace | ced with new components of corr | rect specification. | |
| | | | 3.7.6 | Moving components lubricated with correct appropriate type of lubricant. | | | |
| | | | 3.7.7 | Gear box reassembled to ma | nufacturer's specification. | | |
| | | | 3.7.8 | Required amount of transmis | ssion oil refilled to correct level a | s per manufacture | er's |
| | | | | specification. | | | |
| | | | | Post repair testing carried ou | it as per the checklist. | | |
| | | | 3.8.1 | Unused materials collected a | nd stored in designated place. | | |
| | 3.8 Store tools and equipment | | | Tools and equipment cleaned | d, checked and stored in designat | ted place. | |
| | | | 3.8.3 | Work area cleaned, wiped ar | nd dried. | | |
| | 7 | | | S 11 N 1 | | 2 21 | CTEVA |
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| | 3.8.4 Waste disposed as per 3R's principle at designated location. | | | | | | |
|---|--|--|--|--|--|--|--|
| 6 | Task Performance Requirements (Tools, Equipment and Materials): | | | | | | |
| | • Two-wheeler, service manual, torque wrench, spark plug wrench, socket wrench set, oil can, screw driver set, pliers, multi meter, wire cutter, open and ring spanner set, oil seal remover and installer, measuring container, funnel, tray, container, measuring tape, lock remover, spring compressor, hammer, ring compressor, air compressor, magnet puller, crankshaft puller and installer, crankcase separator, universal holder, sealant, micrometer, tachometer, vernier caliper, dial gauge, bore gauge, V block stand, filler gauge, ring nut wrench, Allen keys, test lamp, diagnostic tools, engine stand, engine components, cooling system components, lubrication system components, fuel system components, clutch unit components, gear box components, distilled water, lubricants, fluids, wire brush, petroleum jelly, emery paper, PVC tape, cloths, rags, cleaning agent, dustbin, dustpan, broom, pen, paper, register, job card, first aid kit and personal protective equipment. | | | | | | |
| 7 | Safety and Hygiene (Occupational Health and Safety): | | | | | | |
| | Use Personal Protective Equipment (PPE). | | | | | | |
| | Safe handling of tools and equipment. | | | | | | |
| | Avoid slippery floor. | | | | | | |
| | Avoid electrical, chemical and fire hazard. | | | | | | |
| | Safe disposal of waste. | | | | | | |





| 0 | Required Knowledge | | | | | | | | |
|---|---|---------------------|---|--|--|--|--|--|--|
| 8 | Technical Knowledge | Applied Calculation | Graphical Information | | | | | | |
| 8 | Technical Knowledge • Tools and equipment • Use and application • Handling technique • Safety measures • Engine • Introduction • Single cylinder and multi cylinder engine • Working process of engine • Components and their function • Measurement of components • Common problems • Repair and maintenance • Cooling system • Introduction • Air cooling and liquid cooling system • Working process of cooling system | Applied Calculation | Graphical Information • Read and interpret service manual | | | | | | |
| | Common problems Repair and maintenance | | | | | | | | |
| | Lubrication system | | | | | | | | |



| 0 | Introduction | |
|-------|--|--|
| 0 | Forced feed, splashed and combined lubrication | |
| | system | |
| 0 | Working process of lubrication system | |
| 0 | Components and their function | |
| 0 | Common problems | |
| 0 | Repair and maintenance | |
| • Fu | el system | |
| 0 | Introduction | |
| 0 | Gravity flow system and Forced feed system | |
| 0 | Working process of fuel system | |
| 0 | Components and their function | |
| 0 | Common problems | |
| 0 | Repair and maintenance | |
| • Tra | ansmission system | |
| 0 | Introduction | |
| 0 | Components and their function | |
| • Clu | itch unit | |
| 0 | Introduction | |
| 0 | Types and working process | |
| 0 | Components and their function | |
| 0 | Common problems | |





| • G | ear box | |
|-------------|-------------------------------|--|
| 0 | Introduction | |
| 0 | Types and working process | |
| 0 | Components and their function | |
| 0 | Common problems | |
| 0 | Repair and maintenance | |
| • Tr | ansmission oil | |
| 0 | Introduction | |
| 0 | Types | |
| 0 | Quality and grade | |
| 0 | Level | |
| • Enviror | mental impact | |
| • Waste | nanagement | |
| Record | keeping | |
| • Occupa | tional health and safety | |
| • First aid | l kit | |





| 9 | | Assessment of Competency | | | | | | | |
|----------|---|--|--|---------------------|------------------|-------------|----------------|--|--|
| | Unit: 3 | Unit: 3 | | | | | | | |
| | Unit Title: Repair engi | ne and | transmission system | | | | | | |
| | | | Candidate Details | | | Assessors D | etail | | |
| | Candidate's Name: | | | Assessors' | Name | | ID/License No: | | |
| | Registration Number: | | | 1. | | | | | |
| | Symbol No: | | | 2. | | | | | |
| | Tost Contro: | | Toct Data: | 2 | | | | | |
| | | 1 | Test Date. | 5. | | [| | | |
| Elei | ement of competency Performance Standards | | Standard Met | Standard Not Met | Evidence Type | Comments | | | |
| 2.4 | | 3.1.1 | Personal protective equipment (PPE) used in | | | | | | |
| 3.1 | Prepare tools and | | accordance with organization standard. | | | | | | |
| | equipment | 3.1.2 | Tools, equipment and materials checked and collected | | | | | | |
| | | | as per task requirement. | | | | | | |
| | | 3.1.3 | Two-wheeler raised on central stand stably. | | | | | | |
| | _ · · | 3.2.1 | Performance of engine checked as per manufacturer's | | | | | | |
| 3.2 | Repair engine | | specification. | | | | | | |
| | | 3.2.2 | Fault in engine identified through visual inspection and | | | | | | |
| | | | testing. | | | | | | |
| | | 3.2.3 Engine dissembled sequentially as per manufacturer's | | | | | | | |
| | | | specification and <i>components</i> tagged. | | | | | | |
| | | 3.2.4 | Components of engine inspected, cleaned and foreign | | | | | | |
| | | | <i>materials</i> removed. | | | | | | |
| \wedge | | 1 | | 1 | | | <u>~~</u> | | |





| | 3.2.5 | Gap and clearance measured and adjusted to | | | | |
|---------------------------|--------|--|---|---|---|--|
| | | manufacturer's specification. | | | | |
| | 3.2.6 | Damaged components replaced with new components | | | | |
| | | of correct specification. | | | | |
| | 3.2.7 | Moving components lubricated as per manufacturer's | | | | |
| | | specification. | | | | |
| | 3.2.8 | Engine reassembled with correct alignment and | | | | |
| | | tightened to manufacturer's specification. | | | | |
| | 3.2.9 | Required amount of engine oil refilled to correct level as | | | | |
| | | per manufacturer's specification. | | | | |
| | 3.2.10 | Post repair testing carried out as per the checklist. | | | | |
| | 3.3.1 | Cooling system inspected as per manufacturer's | | | | |
| 3.3 Repair cooling system | | specification. | | | | |
| | 3.3.2 | Fault in cooling system identified through visual | | | | |
| | | inspection and testing. | | | | |
| | 3.3.3 | Cooling system dissembled sequentially as per | | | | |
| | | manufacturer's specification and components tagged. | | | | |
| | 3.3.4 | Components of cooling system inspected, cleaned and | | | | |
| | | foreign materials removed. | | | | |
| | 3.3.5 | Damaged components replaced with new components | | | | |
| | | of correct specification. | | | | |
| | 3.3.6 | Cooling system reassembled to correct alignment and | | | | |
| | | tightened to manufacturer's specification. | | | | |
| | 3.3.7 | Required amount of coolant refilled to correct level as | | | | |
| | | per manufacturer's specification. | | | | |
| \wedge | • | | • | • | • | |



| | | 3.3.8 | Post repair testing carried ou | it as per the checklist. | | | | |
|------|-------------------------|--------|---------------------------------|----------------------------------|------------------------|---|---------|--|
| | | 3.4.1 | Condition of lubrication syste | em checked as per | | | | |
| 3.4 | Repair lubrication | | manufacturer's specification. | | | | | |
| | System | 3.4.2 | Fault in lubrication system id | entified through visual | | | | |
| | | | inspection and testing. | | | | | |
| | | 3.4.3 | Lubrication system dissemble | ed sequentially as per | | | | |
| | | | manufacturer's specification | and components tagged. | | | | |
| | | 3.4.4 | Components of lubrication sy | stem inspected, cleaned | | | | |
| | | | and foreign materials remove | ed. | | | | |
| | | 3.4.5 | Damaged components replace | ced with new components | | | | |
| | | | of correct specification. | | | | | |
| | | 3.4.6 | Lubrication system reassemb | led to correct alignment | | | | |
| | | | and tightened to manufactur | er's specification. | | | | |
| | | 3.4.7 | Required amount of engine of | oil refilled to correct level as | | | | |
| | | | per manufacturer's specificat | tion. | | | | |
| | | 3.4.8 | Post repair testing carried ou | t as per the checklist. | | | | |
| 2 5 | Donoin contouroton fuel | 3.5.1 | Performance of fuel system of | checked as per | | | | |
| 3.5 | system | | manufacturer's specification. | | | | | |
| | oyotenn | 3.5.2 | Fault in fuel system identified | d through visual inspection | | | | |
| | | | and testing. | | | | | |
| | | 3.5.3 | Fuel system dissembled sequ | ientially as per | | | | |
| | | | manufacturer's specification | and components tagged. | | | | |
| | | 3.5.4 | Components of fuel system in | nspected, cleaned and | | | | |
| | | | foreign materials removed. | | | | | |
| • | | 3.5.5 | Damaged components replace | ced with new components | | | | |
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| | of correct specification. | | | | |
|------------------------|--------------------------------------|---|--------------------------|---------|-------|
| | 3.5.6 Fuel system reassembled to | manufacturer's | | | |
| | specification. | | | | |
| | 3.5.7 Carburetor tune-up perform | ned as per manufacturer's | | | |
| | specification. | | | | |
| | 3.5.8 Post repair testing carried o | ut as per the checklist. | | | |
| | 3.6.1 Performance of clutch check | ked as per manufacturer's | | | |
| 3.6 Repair clutch unit | specification. | | | | |
| | 3.6.2 Fault in clutch identified thr | ough visual inspection and | | | |
| | testing. | | | | |
| | 3.6.3 Clutch unit dissembled sequ | ientially as per | | | |
| | manufacturer's specificatior | n and components tagged. | | | |
| | 3.6.4 Clutch components inspecte | ed, cleaned and foreign | | | |
| | materials removed. | | | | |
| | 3.6.5 Plate thickness and height c | of clutch spring measured | | | |
| | and verified with manufactu | arer's specification. | | | |
| | 3.6.6 Damaged components repla | aced with new components | | | |
| | of correct specification. | | | | |
| | 3.6.7 Moving components lubrica | ted and clutch components | | | |
| | reassembled to manufactur | er's specification. | | | |
| | 3.6.8 Post repair testing carried o | ut as per the checklist. | | | |
| | 3.7.1 Operation of gear box check | ked as per manufacturer's | | | |
| 3.7 Repair gear box | specification. | | | | |
| | 3.7.2 Fault in gear box identified t | through visual inspection | | | |
| | and testing. | | | | |
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| | | 3.7.3 | Gear box dissembled sequentially as per manufacturer's | | |
|-----|-----------------|-------|---|--|--|
| | | | specification and components tagged. | | |
| | | 3.7.4 | Components of gear box inspected, cleaned and foreign | | |
| | | | materials removed. | | |
| | | 3.7.5 | Damaged components replaced with new components | | |
| | | | of correct specification. | | |
| | | 3.7.6 | Moving components lubricated with correct appropriate | | |
| | | | type of lubricant. | | |
| | | 3.7.7 | Gear box reassembled to manufacturer's specification. | | |
| | | 3.7.8 | Required amount of transmission oil refilled to correct | | |
| | | | level as per manufacturer's specification. | | |
| | | 3.7.9 | Post repair testing carried out as per the checklist. | | |
| 2.0 | | 3.8.1 | Unused materials collected and stored in designated | | |
| 3.8 | Store tools and | | place. | | |
| | equipment | 3.8.2 | Tools and equipment cleaned, checked and stored in | | |
| | | | designated place. | | |
| | | 3.8.3 | Work area cleaned, wiped and dried. | | |
| | | 3.8.4 | Waste disposed as per 3R's principle at designated | | |
| | | | location. | | |

| WT- Written Test | OQ - Oral Question | PT- Practical Test | DO – Direct Observation | SR- Supervisor's report | SN –Simulation |
|-----------------------|---------------------------|--------------------|--------------------------------|-----------------------------------|------------------------------|
| RP - Role Play | PG – Photographs | VD- Video | CT – Certificates | TS – Testimonials (Reward) | PP – Product Produced |

CS – Case Study





Range Statement

| Variable | Range |
|--------------------------------------|---|
| Personal protective equipment | May include but not limited to: Helmet Gloves Safety goggles Safety boot Mask Apron |
| Two-wheeler | May include but not limited to: Motorcycle Scooter |
| Visual inspection and testing | May include but not limited to: • Engine • Leakage • Abnormal noise • Vibration • Smoke • Compression pressure • Temperature • Wear and tear • Lubrication • Seizure • Clearance • Oil level • Ignition timing |
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| | | | Valve timing | | | |
|----------|-----------|----------------------------|--|------------------------|---------|--|
| | | | Compression p | pressure | | |
| | | | Piston-cylinder | r-ring end gap | | |
| | | | Cooling system | | | |
| | | | Leakage | | | |
| | | | o Temperature | | | |
| | | | Coolant level | | | |
| | | | Coolant circula | ation | | |
| | | | Lubricating system | า | | |
| | | | ○ Leakage | | | |
| | | | Temperature | | | |
| | | | ○ Oil level | | | |
| | | | Oil circulation | | | |
| | | | Carburetor fuel sy | stem | | |
| | | | Leakage | | | |
| | | | ◦ Idle speed | | | |
| | | | ◦ RPM | | | |
| | | | Air fuel mixture | e | | |
| | | | Clutch unit | | | |
| | | | o Leakage | | | |
| | | | o Free play | | | |
| | | | Abnormal nois | e | | |
| | | | Clutch slip | - | | |
| | | | \circ Vibration | | | |
| | | | Wear and tear | | | |
| | | | Gear box | | | |
| | | | | | | |
| | | | \sim Abnormal nois | ٩ | | |
| | | | | | | |
| | | | | | | |
| | | | | Pc | | |
| \wedge | | | | | | |
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| | | Wear and tea Smooth gear | ır shifting | |
|------------|----------------------------|--|-------------------------|---------|
| Components | | May include but not limited t | 0: | |
| X | | Engine Cylinder head Cylinder block Cylinder block Camshaft assion Piston assemilie Cooling system Radiator Water pump Water pump Water jacket Cooling fan Oil cooler Fins Thermostat vite Uubrication system Oil cooler Oil pump Oil filter rotor Oil plump Oil strainer Carburetor fuel sion Fuel tank Fuel cock Carburetor Fuel hose Fuel hose Fuel filter Clutch unit Clutch outer Primary drive | alve m r ystem | |
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| | | | • Bearing | | | |
|--------------------|----------------------------|-------------|------------------------------------|------------------------|---------|-------|
| | | | Friction plate | | | |
| | | | Clutch plate | | | |
| | | | Clutch centre | | | |
| | | | Pressure plate | | | |
| | | • | Gear box | | | |
| | | | o Main shaft asser | nbly | | |
| | | | o Counter shaft as | sembly | | |
| | | | Bearing | | | |
| | | | \circ $$ Gear shifting for $$ | k | | |
| | | | \circ Gear shifting dru | ım | | |
| | | | Gear shaft | | | |
| | | | o Gear lever | | | |
| Foreign materials | | May include | e hut not limited to: | | | |
| i oreign materials | | way merado | | | | |
| | | • | Dirt | | | |
| | | • | Debris | | | |
| | | • | Rust | | | |
| | | • | Metal particles | | | |
| Plate thickness | | May include | e but not limited to: | | | |
| | | • | Friction plate thickn | ess | | |
| | | • | Clutch center thickn | ess | | |
| | | • | Clutch plate thickne | SS | | |
| | | • | Clutch center pressu | ure thicknesss | | |
| | | | | | | |
| 3R's Principle | | May include | e but not limited to: | | | |
| | | • | Reduce | | | |
| | | • | Reuse | | | |
| | | • | Recycle | | | |
| \wedge | 1 | | | | | CIEVA |
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| 5 | Unit No: 4 Unit Title: Repair electrical and electronic system | | Unit code: |
|---|---|-------|--|
| | Elements of competency | | Performance standards |
| | | 4.1.1 | Personal protective equipment (PPE) used in accordance with organization standard. |
| | 4.1 Prepare tools and equipment | 4.1.2 | Tools, equipment and materials checked and collected as per task requirement. |
| | | 4.1.3 | Two-wheeler raised on central stand stably. |
| | | 4.2.1 | Performance of charging system checked as per manufacturer's specification. |
| | 4.2 Repair charging system | 4.2.2 | Fault in charging system identified from visual inspection and testing. |
| | | 4.2.3 | Charging system dissembled sequentially as per manufacturer's specification and |
| | | | components tagged. |
| | | 4.2.4 | Components of charging system inspected, cleaned and <i>foreign materials</i> removed. |
| | | 4.2.5 | Electrical parameter measured and verified with manufacturer's specification. |
| | | 4.2.6 | Damaged components replaced with new components of correct specification. |
| | | 4.2.7 | Charging system reassembled as per manufacturer's specification. |
| | | 4.2.8 | Post repair testing carried out as per the checklist. |
| | | 4.3.1 | Performance of self-starting system checked as per manufacturer's specification. |
| | 4.3 Repair self-starting system | 4.3.2 | Fault in self-starting system identified from visual inspection and testing. |
| | | 4.3.3 | Self-starting system dissembled sequentially as per manufacturer's specification and |
| | | | components tagged. |
| | | 4.3.4 | Components of self-starting system inspected, cleaned and foreign materials removed. |
| | | 4.3.5 | Electrical parameter measured and verified with manufacturer's specification. |
| | | 4.3.6 | Damaged components replaced with new components of correct specification. |
| | | 4.3.7 | Moving components of self-starter lubricated as per manufacturer's specification. |
| | | 4.3.8 | Self-starting system reassembled to correct alignment and tightened to manufacturer's |
| | | | specification. |





| | | | | 4.3.9 | Post repair testing carried ou | t as per the checklist. | | | | |
|------|---------------------|-----------------|---------------------------------|-------|---|-------------------------------------|---------------------|--------|--|--|
| | | | | 4.4.1 | Performance of ignition syste | em checked as per manufacturer's | specification. | | | |
| | 4.4 Repair ignition | | system | 4.4.2 | Fault in ignition system ident | ified from visual inspection and te | sting. | | | |
| | | | | 4.4.3 | Ignition system dissembled so | equentially as per manufacturer's | specification and | | | |
| | | | | | components tagged. | | | | | |
| | | | | 4.4.4 | Components of ignition syste | m inspected, cleaned and foreign | materials removed | | | |
| | | | | 4.4.5 | Spark plug and electrical para | ameters measured and verified with | h manufacturer's | | | |
| | | | | | specification. | | | | | |
| | | | | 4.4.6 | Damaged components replace | ed with new components of corre | ct specification. | | | |
| | | | | 4.4.7 | Ignition system reassembled | as per manufacturer's specificatio | n. | | | |
| | | | | 4.4.8 | Post repair testing carried ou | t as per the checklist. | | | | |
| | 4 5 | | | 4.5.1 | Lighting system inspected as per manufacturer's specification. | | | | | |
| | 4.5 | Repair lighting | system | 4.5.2 | Fault in lighting system identified from visual inspection and testing. | | | | | |
| | | | | 4.5.3 | Lighting system dissembled sequentially as per manufacturer's specification and | | | | | |
| | | | | | components tagged. | | | | | |
| | | | | 4.5.4 | Components of lighting syste | m inspected, cleaned and foreign | materials removed. | | | |
| | | | | 4.5.5 | Electrical parameters measur | ed and verified with manufacture | r's specification. | | | |
| | | | | 4.5.6 | Damaged components replace | ed with new components of corre | ct specification. | | | |
| | | | | 4.5.7 | Lighting system reassembled | to correct alignment and tightene | d to manufacturer' | S | | |
| | | | | | specification. | | | | | |
| | | | | 4.5.8 | Post repair testing carried ou | t as per the checklist. | | | | |
| | 16 | Popair alactron | sic fuel injection (FEI) system | 4.6.1 | Performance of EFI system ch | necked as per manufacturer's spec | ification. | | | |
| | 4.0 | Repair electron | inc fuel injection (EFI) system | 4.6.2 | Fault in EFI system identified from visual inspection and testing. | | | | | |
| | | | | 4.6.3 | EFI system dissembled seque | ntially as per manufacturer's spec | ification and compo | onents | | |
| ^ | | | | | tagged. | | | | | |
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| | 4.6.4 Components of EFI system inspected, cleaned and foreign materials removed. |
|---|---|
| | 4.6.5 Electrical parameter measured and verified with manufacturer's specification. |
| | 4.6.6 Damaged components replaced with new components of correct specification. |
| | 4.6.7 EFI system reassembled to manufacturer's specification. |
| | 4.6.8 Diagnostic trouble code (DTC) cleared. |
| | 4.6.9 Post repair testing carried out as per the checklist. |
| | 4.7.1 Performance of ABS checked as per manufacturer's specification. |
| 4.7 Repair anti-lock braking system (ABS) | 4.7.2 Fault/issue in ABS identified from visual inspection and testing. |
| | 4.7.3 ABS system dissembled sequentially as per manufacturer's specification and |
| | components tagged. |
| | 4.7.4 Components of ABS inspected, cleaned and foreign materials removed. |
| | 4.7.5 Electrical parameter measured and verified with manufacturer's specification. |
| | 4.7.6 Damaged components replaced with correct specification. |
| | 4.7.7 ABS system reassembled to manufacturer's specification. |
| | 4.7.8 Diagnostic trouble code (DTC) cleared. |
| | 4.7.9 Post repair testing carried out as per the checklist. |
| | 4.8.1 Unused materials collected and stored in designated place. |
| 4.8 Store tools and equipment | 4.8.2 Tools and equipment cleaned, checked and stored in designated place. |
| | 4.8.3 Work area cleaned, wiped and dried. |
| | 4.8.4 Waste disposed as per <i>3R's principle</i> at designated location. |

• Two-wheeler, service manual, screw driver set, pliers, wire cutter, spanner set, battery charger, hydrometer, multimeter, tachometer, air compressor, Allen keys, test lamp, diagnostic tools, tray, containers, charging system components, self-starting system components, ignition system components, lighting system components, EFI system components, ABS system components, distilled water, wire brush, petroleum





| | jelly, emery paper, PVC tape, cloths, rags, cleaning agent, dustbin, dustpan, broom, pen, paper, register, job card, first aid kit and personal protective equipment. |
|---|---|
| 7 | Safety and Hygiene (Occupational Health and Safety): |
| | Use Personal Protective Equipment (PPE). |
| | Safe handling of tools and equipment. |
| | Avoid slippery floor. |
| | Avoid electrical, chemical and fire hazard. |
| | Safe disposal of waste. |





| | Required Knowledge | | | | | | | | | |
|-----|--|----------|-----------|----------------------|-----|---|--------------------------|--|--|--|
| 8 | Technical Knowledge | | Applied C | alculation | | Graphical Information | on | | | |
| | Tools and equipment Use and application Handling technique Safety measures Motorcycle electrical and electronic system Charging system Introduction Types and working process Components and their function Layout and circuit diagram Common problems Repair and maintenance Self-starting system Introduction Types and working process Common problems Repair and maintenance Self-starting system Introduction Types and working process Common problems Repair and maintenance Self-starting system Introduction Types and working process Components and their function Layout and circuit diagram Common problems Repair and maintenance | | | | • | Read and interpret wi diagram Read and interpret se manual | iring | | | |
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| 0 | Introduction | |
|--------|-------------------------------|--|
| 0 | Types and working process | |
| 0 | Components and their function | |
| 0 | Layout and circuit diagram | |
| 0 | Common problems | |
| 0 | Repair and maintenance | |
| • Ligh | nting system | |
| 0 | Introduction | |
| 0 | Types and working process | |
| 0 | Components and their function | |
| 0 | Layout and circuit diagram | |
| 0 | Common problems | |
| 0 | Repair and maintenance | |
| • Elec | ctronic fuel injection system | |
| 0 | Introduction | |
| 0 | Types and working process | |
| 0 | Components and their function | |
| 0 | Layout and circuit diagram | |
| 0 | Common problems | |
| 0 | Repair and maintenance | |
| • Ant | i-lock braking system | |
| 0 | Introduction | |
| | | |



| | • Types and working process | |
|---|--|--|
| | • Components and their function | |
| | Layout and circuit diagram | |
| | • Common problems | |
| | • Repair and maintenance | |
| • | Electrical parameters | |
| • | Diagnostic tools | |
| • | Environmental impact | |
| • | Waste Management | |
| • | Record keeping | |
| • | Occupational health and safety | |
| • | First aid kit | |





| 9 | Assessment of Competency | | | | | | | | | |
|------|--|-------------------------|--|---------------------|------------------|-------------|----------------|--|--|--|
| | Unit: 4 | | | | | | | | | |
| | Unit Title: Repair elect | trical ar | d electronic system | | | | | | | |
| | | | Candidate Details | | | Assessors D | etail | | | |
| | Candidate's Name: | | | Assessors' | Name | | ID/License No: | | | |
| | Registration Number: | | | 1. | | | | | | |
| | Symbol No: | | | 2. | | | | | | |
| | Test Centre: | | Test Date: | 3. | | | | | | |
| Eler | ment of competency Performance Standards | | Standard Met | Standard Not Met | Evidence Type | Comments | | | | |
| | | 4.1.1 | Personal protective equipment (PPE) used in | | | | | | | |
| 4.1 | Prepare tools and | | accordance with organization standard. | | | | | | | |
| | equipment | 4.1.2 | Tools, equipment and materials checked and collected | | | | | | | |
| | | | as per task requirement. | | | | | | | |
| | | 4.1.3 | Two-wheeler raised on central stand stably. | | | | | | | |
| | | 4.2.1 | Performance of charging system checked as per | | | | | | | |
| 4.2 | Repair charging | | manufacturer's specification. | | | | | | | |
| | system | 4.2.2 | Fault in charging system identified from visual | | | | | | | |
| | | inspection and testing. | | | | | | | | |
| | | 4.2.3 | Charging system dissembled sequentially as per | | | | | | | |
| | manufacturer's specification and <i>components</i> tagged. | | | | | | | | | |
| | | 4.2.4 | Components of charging system inspected, cleaned and | | | | | | | |
| | | | foreign materials removed. | | | | | | | |





| | 4.2.5 <i>Electrical parameter</i> measured and verified with |
|--------------------------|--|
| | manufacturer's specification. |
| | 4.2.6 Damaged components replaced with new components |
| | of correct specification. |
| | 4.2.7 Charging system reassembled as per manufacturer's |
| | specification. |
| | 4.2.8 Post repair testing carried out as per the checklist. |
| | 4.3.1 Performance of self-starting system checked as per |
| 4.3 Repair self-starting | manufacturer's specification. |
| system | 4.3.2 Fault in self-starting system identified from visual |
| | inspection and testing. |
| | 4.3.3 Self-starting system dissembled sequentially as per |
| | manufacturer's specification and components tagged. |
| | 4.3.4 Components of self-starting system inspected, cleaned |
| | and foreign materials removed. |
| | 4.3.5 Electrical parameter measured and verified with |
| | manufacturer's specification. |
| | 4.3.6 Damaged components replaced with new components |
| | of correct specification. |
| | 4.3.7 Moving components of self-starter lubricated as per |
| | manufacturer's specification. |
| | 4.3.8 Self-starting system reassembled to correct alignment |
| | and tightened to manufacturer's specification. |
| | 4.3.9 Post repair testing carried out as per the checklist. |





| | D | 4.4.1 | Performance of ignition system of | checked as per | | | | | |
|-----|---|--------|-------------------------------------|--------------------------|------------|-------------|----|---------|--|
| 4.4 | Repair ignition system | | manufacturer's specification. | | | | | | |
| | | 4.4.2 | Fault in ignition system identified | d from visual inspection | | | | | |
| | | | and testing. | | | | | | |
| | | 4.4.3 | Ignition system dissembled seque | entially as per | | | | | |
| | | | manufacturer's specification and | components tagged. | | | | | |
| | | 4.4.4 | Components of ignition system in | nspected, cleaned and | | | | | |
| | | | foreign materials removed. | | | | | | |
| | | 4.4.5 | Spark plug and electrical parame | ters measured and | | | | | |
| | | | verified with manufacturer's spec | cification. | | | | | |
| | | 4.2.9 | Damaged components replaced | with new components | | | | | |
| | | | of correct specification. | | | | | | |
| | | 4.4.6 | Ignition system reassembled as p | per manufacturer's | | | | | |
| | | | specification. | | | | | | |
| | | 4.4.7 | Post repair testing carried out as | per the checklist. | | | | | |
| 4 5 | Donoin lighting quatom | 4.5.1 | Lighting system inspected as per | manufacturer's | | | | | |
| 4.5 | Repair lighting system | | specification. | | | | | | |
| | | 4.5.2 | Fault in lighting system identified | d from visual inspection | | | | | |
| | | | and testing. | | | | | | |
| | | 4.5.3 | Lighting system dissembled sequ | entially as per | | | | | |
| | manufacturer's specification and components tagged. | | | | | | | | |
| | | 4.5.4 | Components of lighting system in | nspected, cleaned and | | | | | |
| | | | foreign materials removed. | | | | | | |
| | | 4.5.5 | Electrical parameters measured a | and verified with | | | | | |
| ٨ | | | manufacturer's specification. | | | | | | |
| | | Dovolo | nod Date: 2022-05 1/ | vision Number ## | Povisod D | ato: dd/mm/ | | Dago:E/ | |
| | | Develo | Peu Date: 2023-03-14 Rev | | Revised Da | ate: uu/mm/ | уу | rage:34 | |





| | | 4.2.10 | Damaged components replac | ed with new components | | | |
|-----|------------------------|--------|---------------------------------|------------------------------|------------------------|------------|-------|
| 1 | | | of correct specification. | | | l | |
| 1 | | 4.5.6 | Lighting system reassembled | to correct alignment and | | l | |
| I | | | tightened to manufacturer's | specification. | | l | |
| I | | 4.5.7 | Post repair testing carried ou | t as per the checklist. | | 1 | |
| | | 4.6.1 | Performance of EFI system ch | necked as per | | | |
| 4.6 | Repair electronic fuel | | manufacturer's specification. | | | l | |
| I | injection (EFI) system | 4.6.2 | Fault in EFI system identified | from visual inspection and | | l | |
| I | | | testing. | | | l | |
| I | | 4.6.3 | EFI system dissembled seque | ntially as per | | l | |
| I | | | manufacturer's specification | and components tagged. | | 1 | |
| I | | 4.6.4 | Components of EFI system in | spected, cleaned and | | l | |
| I | | | foreign materials removed. | | | 1 | |
| I | | 4.6.5 | Electrical parameter measure | ed and verified with | | l | |
| I | | | manufacturer's specification. | | | l | |
| I | | 4.6.6 | Damaged components replace | ed with new components | | l | |
| I | | | of correct specification. | | | l | |
| I | | 4.6.7 | EFI system reassembled to m | anufacturer's specification. | | l | |
| I | | 4.6.8 | Post repair testing carried ou | t as per the checklist. | | 1 | |
| | | 4.7.1 | Performance of ABS checked | as per manufacturer's | | | |
| 4.7 | Repair anti-lock | | specification. | | | l | |
| 1 | braking system (ADS) | 4.7.2 | Fault/issue in ABS identified f | rom visual inspection and | | l | |
| I | | | testing. | | | l | |
| I | | 4.7.3 | ABS system dissembled seque | entially as per | | l | |
| • | | | manufacturer's specification | and components tagged. | | 1 | |
| | 7 | | - | | | | CTEVT |
| | | Dates | | Dervision Mission Hill | Device al Determinal / | DessEE | |

| | | 4.7.4 | Components of ABS inspected, cleaned and foreign | | |
|-----|-----------------|-------|---|--|--|
| | | | materials removed. | | |
| | | 4.7.5 | Electrical parameter measured and verified with | | |
| | | | manufacturer's specification. | | |
| | | 4.7.6 | Damaged components replaced with correct | | |
| | | | specification. | | |
| | | 4.7.7 | ABS system reassembled to manufacturer's | | |
| | | | specification. | | |
| | | 4.7.8 | Post repair testing carried out as per the checklist. | | |
| | | 4.8.1 | Unused materials collected and stored in designated | | |
| 4.8 | Store tools and | | place. | | |
| | equipment | 4.8.2 | Tools and equipment cleaned, checked and stored in | | |
| | | | designated place. | | |
| | | 4.8.3 | Work area cleaned, wiped and dried. | | |
| | | 4.8.4 | Waste disposed as per 3R's principle at designated | | |
| | | | location. | | |

| WT- Written Test | OQ- Oral Question | PT- Practical Test | DO – Direct Observation | SR- Supervisor's report | SN –Simulation |
|-----------------------|-------------------|--------------------|--------------------------------|-----------------------------------|------------------------------|
| RP - Role Play | PG –Photographs | VD - Video | CT – Certificates | TS – Testimonials (Reward) | PP – Product Produced |

CS – Case Study





Range Statement

| Variable | | Range | | | | |
|----------------------------------|------|---|--|----------------------------------|---------|--|
| Personal protective equipment | Μ | May include but not limited to: Helmet Gloves Safety goggles Safety boot Mask Apron | | | | |
| Two-wheeler | М | May include but not limited to: Motorcycle Scooter | | | | |
| Visual inspection and testing | Μ | May include but not limited to: Charging system Burn Oxidation/corrosio Open/short circuit Low/over charging Voltage Ampere Resistance Self-starting system Burn Oxidation/corrosio Open/short circuit | | sion lit ng sion lit | | |
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| | o Ampere |
|----------|--|
| | Resistance |
| | Continuity |
| | Ignition system |
| | o Burn |
| | Oxidation/corrosion |
| | Spark plug electrode gap |
| | \circ Spark quality |
| | Spark leakage |
| | Open/short circuit |
| | Continuity |
| | Voltage |
| | o Ampere |
| | o Resistance |
| | Lighting system |
| | o Burn |
| | Oxidation/corrosion |
| | o Fuse |
| | o Breakage |
| | o Damage |
| | Open/short circuit |
| | o Continuity |
| | Voltage |
| | o Ampere |
| | o Resistance |
| | Electronic fuel injection system |
| | Fuel leakage |
| | Air leakage |
| | Wear and tear |
| | Oxidation/corrosion |
| | o Fuse |
| \wedge | <u>~</u> |





| | | Breakage | | | |
|---------------------------------------|------------|--------------------------------------|------------------------|---------|----------------------------|
| | | Damage | | | |
| | | Throttle respon | se | | |
| | | Open/short circ | uit | | |
| | | Continuity | | | |
| | | Voltage | | | |
| | | o Ampere | | | |
| | | Resistance | | | |
| | | Fuel pump pres | sure | | |
| | | Injector spray p | attern | | |
| | | Malfunction inc | licator lamp (MIL) | | |
| | | Diagnostic trou | ole code (DTC) | | |
| | • | Anti-lock braking sy | vstem | | |
| | | Fluid leakage | | | |
| | | Air leakage | | | |
| | | Wear and tear | | | |
| | | Oxidation/corro | osion | | |
| | | o Fuse | | | |
| | | Breakage | | | |
| | | Damage | | | |
| | | Open/short circ | uit | | |
| | | Continuity | | | |
| | | Voltage | | | |
| | | o Ampere | | | |
| | | Resistance | | | |
| | | Hydraulic pump | pressure | | |
| | | Inlet and outlet | valve | | |
| | | Malfunction inc | licator lamp (MIL) | | |
| | | Diagnostic trou | ble code (DTC) | | |
| | | | | | |
| Components | May inc | clude but not limited to: | | | |
| | | | | | OTEVT |
| > > > > > > > > > > > > > > > > > > > | -05-14 Rev | vision Number ## | Revised Date: dd/mm/yy | Page:59 | |
| | | | 1 | | Concertainty of the second |

| Charging system | |
|--|--|
| Battery | |
| Stator coil | |
| Fly wheel magneto | |
| Regulator rectifier unit | |
| Wiring harness | |
| ○ Fuse | |
| Ignition switch | |
| Self-starting system | |
| Ignition switch | |
| o Fuse | |
| Battery | |
| Main switch | |
| Starter motor | |
| Self-starter clutch | |
| Starter relay | |
| Starting circuit cut-off relay | |
| Neutral switch | |
| Clutch switch | |
| Side stand switch | |
| Engine stop switch | |
| Self-start switch | |
| Wiring harness and connectors | |
| Brake switch | |
| Capacitor discharge unit/Engine control unit | |
| Armature-carbon brush | |
| Ignition system | |
| Ignition switch | |
| Kill switch | |
| Battery | |
| o Fuse | |
| | |





| | | | Spark plug/plug | сар | | |
|---|----------------------------|----------|--------------------------------------|------------------------|---------|-------|
| | | | Stator coil | | | |
| | | | Fly wheel magnet | eto | | |
| | | | Pickup coil | | | |
| | | | o CDI/ECU | | | |
| | | | Ignition coil | | | |
| | | | Side stand switc | h | | |
| | | | • Wiring harness a | and connectors | | |
| | | • | Lighting system | | | |
| | | | Janition switch | | | |
| | | | Light switch | | | |
| | | | Battery | | | |
| | | | > Fuse | | | |
| | | | > Relay | | | |
| | | | Flasher relay | | | |
| | | | o Buzzer | | | |
| | | | o Coil | | | |
| | | | Head light | | | |
| | | | Parking light | | | |
| | | | Tail light | | | |
| | | | Side light | | | |
| | | | Brake light | | | |
| | | | Neutral light | | | |
| | | | Instrument panel | el | | |
| | | | o Horn | | | |
| | | | • Wiring harness a | and connectors | | |
| | | • | Electronic fuel injec | tion system | | |
| | | | Jgnition switch | | | |
| | | | Battery | | | |
| | | | > Fuse | | | |
| | | | D ECU | | | |
| | | | Throttle body | | | CTEVA |
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| V | | | | | | |

| | Canister |
|-------------------|--|
| | Sensors: MAP, intake air temperature, engine oil temperature sensor, |
| | throttle position sensor, lean/bank angle sensor, crankshaft position sensor, |
| | 02 |
| | • Actuators: ideal air control valve (IACV), injector, MIL, fuel pump, electronic |
| | purge valve, ignition coil, relay |
| | Wiring harness and connectors |
| | Fuel hose |
| | Air vent tube |
| | Anti-lock braking system |
| | Ignition switch |
| | o Battery |
| | o Fuse |
| | Hydraulic electronic control unit (HECU) |
| | Rotor/encoder |
| | Wheel speed sensor |
| | Wiring harness and connectors |
| | Brake master cylinder |
| | Brake fluid reservoir |
| | Brake hose pipe |
| | o Calliper |
| | Brake discs |
| | o Brake pad |
| | Many include but not limited to |
| Foreign materials | May include but not limited to: |
| | Dirt |
| | Debris |
| | • Rust |
| | Carbon |
| | Metal particles |





| Electrical parameters | May include but not limited to: Continuity Voltage Ampere Resistance Short circuit Open circuit | |
|-----------------------|---|--|
| 3R's Principle | May include but not limited to: Reduce Reuse Recycle | |



