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

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Recommended by Automobile Technical Sub Committee: July 2015 (Ashad 2072)

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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

5	**Unit No:1** **Unit Title: Perform periodic maintenance**	**Unit code:**
	Elements of competency	**Performance standards**
	1.1 Prepare tools, equipment and material	1.1.1 ***Personal protective equipment (PPE)*** used in accordance with organization standard. 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 Perform periodic maintenance of mechanical components	1.2.1 Two-wheeler washed and dried. 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 ***foreign materials*** 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 Perform periodic maintenance of electrical components	1.3.1 ***Electrical components*** inspected visually for defects. 1.3.2 Electrical components disassembled sequentially as per manufacturer's specification 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.

		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 Change fluid and coolant	1.4.1 ***Fluid*** and coolant level and condition checked. 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 ***Specified grade*** of fluid and coolant filled to specified level. 1.4.6 Spilled fluid cleaned from engine.
	1.5 Clean workshop	1.5.1 Unused materials collected and stored in 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.
6	**Task Performance Requirements (Tools, Equipment 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 plug wrench, spark plug cleaner, feeler gauge, sand paper, oil container, tyre pressure gauge, air compressor, water pressure pump, spark plug, O-ring, seal, gasket, air filter, engine oil, transmission oil, fork oil, oil filter, lubricating oil, oil can, specified grease, cloth, rags, control cables, kerosene, petrol, gasket, fuel filter, cleaning agents, water, polish, brake shoe, brake pad, chain sprocket, rear suspension assembly, patch, glue, diagnostic tools, dustpan, dustbin, 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.

8	Required Knowledge		
	Technical Knowledge	**Applied 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
	  ○ Brake system
	  ○ Steering system
	  ○ Ignition system
	  ○ Lubrication system
	  ○ Cooling system
	  ○ Electrical system
	• Types and uses of fluid and coolant
	• Periodic maintenance and servicing
	• Washing and drying procedure
	• Adjustment of components
	• Air and fuel filter
			• Read and interpret wiring diagram
			• Read and interpret service manual

	○ 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 periodic/preventive maintenance**					
	Candidate Details			**Assessors Detail**		
	Candidate's Name: Registration Number: Symbol No: Test Centre: Test Date:			Assessors' Name 1. 2. 3.		ID/License No:
Element of competency	**Performance Standards**		**Standard Met**	**Standard Not Met**	**Evidence Type**	**Comments**
1.1 Prepare tools, equipment and material	1.1.1 ***Personal protective equipment (PPE)*** used in accordance with organization standard. 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 Perform periodic maintenance of mechanical components	1.2.1 Two-wheeler washed and dried. 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 ***foreign materials*** 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 Perform periodic maintenance of electrical components	1.3.1 ***Electrical components*** inspected visually for defects. 1.3.2 Electrical components disassembled sequentially as per manufacturer's specification 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. 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 Change fluid and coolant	1.4.1 ***Fluid*** and coolant level and condition checked. 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 ***Specified grade*** of fluid and coolant filled to specified level. 1.4.6 Spilled fluid cleaned from engine.				
1.5 Clean workshop	1.5.1 Unused materials collected and stored in 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

	• 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

Electrical components	*May include but not limited to:* • Battery • Bulb/LED • Switch • Wiring harness • Control cables and connectors • Relay • Flasher • Instrument panel • Horn • Fuse • Head light • Parking light • Tail light • Side light • Brake light • Neutral light • Side stand light
Electrical parameters	*May include but not limited to:* • Continuity • Voltage • Ampere • Resistance • Short circuit • Open circuit
Fluid	*May include but not limited to:* • Engine oil

	• 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
	  ○ DOT-3
	  ○ 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 Prepare tools and equipment	2.1.1 ***Personal protective equipment (PPE)*** used in accordance with organization standard. 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 Repair suspension system	2.2.1 Suspension system inspected for visible damage. 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 ***components*** tagged. 2.2.4 Components of suspension system inspected, cleaned and ***foreign materials*** 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 Repair brake system	2.3.1 Performance of brake system checked as per 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 Repair steering system	2.4.1 Condition of steering system checked as per manufacturer's specification. 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 Store tools and equipment	2.5.1 Unused materials collected and stored in designated place. 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.

8	Required Knowledge		
	Technical Knowledge	**Applied Calculation**	**Graphical Information**

	• Tools and equipment
	  ○ Use and application
	  ○ Handling technique
	  ○ Safety measures
	• Control system and components
	• Suspension system
	  ○ Introduction
	  ○ Types of suspension system and working process
	  ○ Components and their function
	  ○ Common problems
	  ○ Repair and maintenance
	• Braking system
	  ○ Introduction
	  ○ Types of brake system and working process
	  ○ Components and their function
	  ○ Brake problems
	  ○ Brake repair and maintenance
	• Steering system
	  ○ Introduction
	  ○ Types and working process
			• Read and interpret service manual

	○ Components and their function ○ Common problems ○ Repair and maintenance • Fluid and Lubricants ○ Introduction ○ Types ○ Quality and grade ○ Level ○ Common problems • Occupational health and safety • Waste management • Record keeping • First aid kit		

9	**Assessment of Competency**					
	Unit: 2 **Unit Title: Repair control system**					
	Candidate Details			**Assessors Detail**		
	Candidate's Name: Registration Number: Symbol No: Test Centre: Test Date:			Assessors' Name 1. 2. 3.		ID/License No:
Element of competency	**Performance Standards**		**Standard Met**	**Standard Not Met**	**Evidence Type**	**Comments**
2.1 Prepare tools and equipment	2.1.1 ***Personal protective equipment (PPE)*** used in accordance with organization standard. 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 Repair suspension system	2.2.1 Suspension system inspected for visible damage or wear. 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 ***components*** tagged. 2.2.4 Components of suspension system inspected, cleaned and ***foreign materials*** 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 Repair brake system	2.3.1 Performance of brake system checked as per 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 Repair steering system	2.4.1 Condition of steering system checked as per manufacturer's specification. 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 Store tools and equipment	2.5.1 Unused materials collected and stored in designated place. 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

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

	• 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
	  ○ Union bolt
	  ○ Bleeder valve
	  ○ Pad spring

	• 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**
	3.1 Prepare tools and equipment	3.1.1 ***Personal protective equipment (PPE)*** used in accordance with organization standard. 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 Repair engine	3.2.1 Performance of engine checked as per manufacturer's 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 ***components*** tagged. 3.2.4 Components of engine inspected, cleaned and ***foreign materials*** removed. 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 Repair cooling system	3.3.1 Cooling system inspected as per manufacturer's 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. 3.3.8 Post repair testing carried out as per the checklist.
	3.4 Repair lubrication system	3.4.1 Condition of lubrication system checked as per manufacturer's specification. 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 Repair carburetor fuel system	3.5.1 Performance of fuel system checked as per manufacturer's specification. 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.

	3.6 Repair clutch unit	3.6.1 Performance of clutch checked as per manufacturer's specification. 3.6.2 Fault in clutch identified through visual inspection and testing. 3.6.3 Clutch unit dissembled sequentially as per manufacturer's specification and components tagged. 3.6.4 Clutch components inspected, cleaned and foreign materials removed. 3.6.5 ***Plate thickness*** and height of clutch spring measured and verified with manufacturer's specification. 3.6.6 Damaged components replaced with new components of correct specification. 3.6.7 Moving components lubricated and clutch components reassembled to manufacturer's specification. 3.6.8 Post repair testing carried out as per the checklist.
	3.7 Repair gear box	3.7.1 Operation of gear box checked as per manufacturer's specification. 3.7.2 Fault in gear box identified through visual inspection and testing. 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.
	3.8 Store tools and equipment	3.8.1 Unused materials collected and stored in designated place. 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.
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.	

8	Required Knowledge		
	Technical Knowledge	**Applied Calculation**	**Graphical Information**

	• 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
	  ○ Components and their function
	  ○ Common problems
	  ○ Repair and maintenance
	• Lubrication system
			• Read and interpret service manual

	○ Introduction ○ Forced feed, splashed and combined lubrication system ○ Working process of lubrication system ○ Components and their function ○ Common problems ○ Repair and maintenance • Fuel system ○ Introduction ○ Gravity flow system and Forced feed system ○ Working process of fuel system ○ Components and their function ○ Common problems ○ Repair and maintenance • Transmission system ○ Introduction ○ Components and their function • Clutch unit ○ Introduction ○ Types and working process ○ Components and their function ○ Common problems		

	• Gear box
	  ○ Introduction
	  ○ Types and working process
	  ○ Components and their function
	  ○ Common problems
	  ○ Repair and maintenance
	• Transmission oil
	  ○ Introduction
	  ○ Types
	  ○ Quality and grade
	  ○ Level
	• Environmental impact
	• Waste management
	• Record keeping
	• Occupational health and safety
	• First aid kit		

9	**Assessment of Competency**					
	Unit: 3 **Unit Title: Repair engine and transmission system**					
	Candidate Details			**Assessors Detail**		
	Candidate's Name: Registration Number: Symbol No: Test Centre: Test Date:			Assessors' Name 1. 2. 3.		ID/License No:
Element of competency	**Performance Standards**		**Standard Met**	**Standard Not Met**	**Evidence Type**	**Comments**
3.1 Prepare tools and equipment	3.1.1 ***Personal protective equipment (PPE)*** used in accordance with organization standard. 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 Repair engine	3.2.1 Performance of engine checked as per manufacturer's 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 ***components*** tagged. 3.2.4 Components of engine inspected, cleaned and ***foreign materials*** removed.					

	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 Repair cooling system	3.3.1 Cooling system inspected as per manufacturer's 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.				

	3.3.8 Post repair testing carried out as per the checklist.				
3.4 Repair lubrication system	3.4.1 Condition of lubrication system checked as per manufacturer's specification. 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 Repair carburetor fuel system	3.5.1 Performance of fuel system checked as per manufacturer's specification. 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.				
3.6 Repair clutch unit	3.6.1 Performance of clutch checked as per manufacturer's specification. 3.6.2 Fault in clutch identified through visual inspection and testing. 3.6.3 Clutch unit dissembled sequentially as per manufacturer's specification and components tagged. 3.6.4 Clutch components inspected, cleaned and foreign materials removed. 3.6.5 ***Plate thickness*** and height of clutch spring measured and verified with manufacturer's specification. 3.6.6 Damaged components replaced with new components of correct specification. 3.6.7 Moving components lubricated and clutch components reassembled to manufacturer's specification. 3.6.8 Post repair testing carried out as per the checklist.				
3.7 Repair gear box	3.7.1 Operation of gear box checked as per manufacturer's specification. 3.7.2 Fault in gear box identified through visual inspection and testing.				

	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.				
3.8 Store tools and equipment	3.8.1 Unused materials collected and stored in designated place. 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

	○ Valve timing ○ Compression pressure ○ Piston-cylinder-ring end gap • Cooling system ○ Leakage ○ Temperature ○ Coolant level ○ Coolant circulation • Lubricating system ○ Leakage ○ Temperature ○ Oil level ○ Oil circulation • Carburetor fuel system ○ Leakage ○ Idle speed ○ RPM ○ Air fuel mixture • Clutch unit ○ Leakage ○ Free play ○ Abnormal noise ○ Clutch slip ○ Vibration ○ Wear and tear • Gear box ○ Leakage ○ Abnormal noise ○ Gear slip ○ Physical damage ○ Vibration

	○ Wear and tear ○ Smooth gear shifting
Components	*May include but not limited to:* • Engine ○ Cylinder head assembly ○ Cylinder block ○ Camshaft assembly ○ Piston assembly • Cooling system ○ Radiator ○ Water pump ○ Water jacket ○ Cooling fan ○ Oil cooler ○ Fins ○ Thermostat valve • Lubrication system ○ Oil cooler ○ Oil pump ○ Oil filter rotor ○ Oil strainer • Carburetor fuel system ○ Fuel tank ○ Fuel cock ○ Carburetor ○ Fuel hose ○ Fuel filter • Clutch unit ○ Clutch outer ○ Primary drive gear

	○ Bearing ○ Friction plate ○ Clutch plate ○ Clutch centre ○ Pressure plate • Gear box ○ Main shaft assembly ○ Counter shaft assembly ○ Bearing ○ Gear shifting fork ○ Gear shifting drum ○ Gear shaft ○ Gear lever
Foreign materials	*May include but not limited to:* • Dirt • Debris • Rust • Metal particles
Plate thickness	*May include but not limited to:* • Friction plate thickness • Clutch center thickness • Clutch plate thickness • Clutch center pressure thicknesss
3R's Principle	*May include but not limited to:* • Reduce • Reuse • Recycle

5	**Unit No: 4** **Unit Title: Repair electrical and electronic system**	**Unit code:**
	Elements of competency	**Performance standards**
	4.1 Prepare tools and equipment	4.1.1 ***Personal protective equipment (PPE)*** used in accordance with organization standard. 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 Repair charging system	4.2.1 Performance of charging system checked as per manufacturer's specification. 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 ***foreign materials*** 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 Repair self-starting system	4.3.1 Performance of self-starting system checked as per manufacturer's specification. 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.
	4.4 Repair ignition system	4.4.1 Performance of ignition system checked as per manufacturer's specification. 4.4.2 Fault in ignition system identified from visual inspection and testing. 4.4.3 Ignition system dissembled sequentially as per manufacturer's specification and components tagged. 4.4.4 Components of ignition system inspected, cleaned and foreign materials removed. 4.4.5 Spark plug and electrical parameters measured and verified with manufacturer's specification. 4.4.6 Damaged components replaced with new components of correct specification. 4.4.7 Ignition system reassembled as per manufacturer's specification. 4.4.8 Post repair testing carried out as per the checklist.
	4.5 Repair lighting system	4.5.1 Lighting system inspected as per manufacturer's specification. 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 system inspected, cleaned and foreign materials removed. 4.5.5 Electrical parameters measured and verified with manufacturer's specification. 4.5.6 Damaged components replaced with new components of correct specification. 4.5.7 Lighting system reassembled to correct alignment and tightened to manufacturer's specification. 4.5.8 Post repair testing carried out as per the checklist.
	4.6 Repair electronic fuel injection (EFI) system	4.6.1 Performance of EFI system checked as per manufacturer's specification. 4.6.2 Fault in EFI system identified from visual inspection and testing. 4.6.3 EFI system dissembled sequentially as per manufacturer's specification and components tagged.

		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 Repair anti-lock braking system (ABS)	4.7.1 Performance of ABS checked as per manufacturer's specification. 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 Store tools and equipment	4.8.1 Unused materials collected and stored in designated place. 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.
6	**Task Performance Requirements (Tools, Equipment and Materials):** • 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.

8	Required Knowledge		
	Technical Knowledge	**Applied Calculation**	**Graphical Information**

	• 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
	  ○ Components and their function
	  ○ Layout and circuit diagram
	  ○ Common problems
	  ○ Repair and maintenance
	• Ignition system
			• Read and interpret wiring diagram
			• Read and interpret service manual

	○ Introduction ○ Types and working process ○ Components and their function ○ Layout and circuit diagram ○ Common problems ○ Repair and maintenance • Lighting system ○ Introduction ○ Types and working process ○ Components and their function ○ Layout and circuit diagram ○ Common problems ○ Repair and maintenance • Electronic fuel injection system ○ Introduction ○ Types and working process ○ Components and their function ○ Layout and circuit diagram ○ Common problems ○ Repair and maintenance • Anti-lock braking system ○ 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 electrical and electronic system**					
	Candidate Details			**Assessors Detail**		
	Candidate's Name: Registration Number: Symbol No: Test Centre: Test Date:			Assessors' Name 1. 2. 3.		ID/License No:
Element of competency	**Performance Standards**		**Standard Met**	**Standard Not Met**	**Evidence Type**	**Comments**
4.1 Prepare tools and equipment	4.1.1 ***Personal protective equipment (PPE)*** used in accordance with organization standard. 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 Repair charging system	4.2.1 Performance of charging system checked as per manufacturer's specification. 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 ***foreign materials*** 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 Repair self-starting system	4.3.1 Performance of self-starting system checked as per manufacturer's specification. 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.				

4.4 Repair ignition system	4.4.1 Performance of ignition system checked as per manufacturer's specification. 4.4.2 Fault in ignition system identified from visual inspection and testing. 4.4.3 Ignition system dissembled sequentially as per manufacturer's specification and components tagged. 4.4.4 Components of ignition system inspected, cleaned and foreign materials removed. 4.4.5 Spark plug and electrical parameters measured and verified with manufacturer's specification. 4.2.9 Damaged components replaced with new components of correct specification. 4.4.6 Ignition system reassembled as per manufacturer's specification. 4.4.7 Post repair testing carried out as per the checklist.				
4.5 Repair lighting system	4.5.1 Lighting system inspected as per manufacturer's specification. 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 system inspected, cleaned and foreign materials removed. 4.5.5 Electrical parameters measured and verified with manufacturer's specification.				

	4.2.10 Damaged components replaced with new components of correct specification. 4.5.6 Lighting system reassembled to correct alignment and tightened to manufacturer's specification. 4.5.7 Post repair testing carried out as per the checklist.				
4.6 Repair electronic fuel injection (EFI) system	4.6.1 Performance of EFI system checked as per manufacturer's specification. 4.6.2 Fault in EFI system identified from visual inspection and testing. 4.6.3 EFI system dissembled sequentially as per manufacturer's specification and components tagged. 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 Post repair testing carried out as per the checklist.				
4.7 Repair anti-lock braking system (ABS)	4.7.1 Performance of ABS checked as per manufacturer's specification. 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 Post repair testing carried out as per the checklist.				
4.8 Store tools and equipment	4.8.1 Unused materials collected and stored in designated place. 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	*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:*
	• Charging system
	  ○ Burn
	  ○ Oxidation/corrosion
	  ○ Open/short circuit
	  ○ Low/over charging
	  ○ Voltage
	  ○ Ampere
	  ○ Resistance
	• Self-starting system
	  ○ Burn
	  ○ Oxidation/corrosion
	  ○ Open/short circuit
	  ○ Voltage

	○ Ampere ○ Resistance ○ Continuity • Ignition system ○ Burn ○ Oxidation/corrosion ○ Spark plug electrode gap ○ Spark quality ○ Spark leakage ○ Open/short circuit ○ Continuity ○ Voltage ○ Ampere ○ Resistance • Lighting system ○ Burn ○ Oxidation/corrosion ○ Fuse ○ Breakage ○ Damage ○ Open/short circuit ○ Continuity ○ Voltage ○ Ampere ○ Resistance • Electronic fuel injection system ○ Fuel leakage ○ Air leakage ○ Wear and tear ○ Oxidation/corrosion ○ Fuse

	○ Breakage ○ Damage ○ Throttle response ○ Open/short circuit ○ Continuity ○ Voltage ○ Ampere ○ Resistance ○ Fuel pump pressure ○ Injector spray pattern ○ Malfunction indicator lamp (MIL) ○ Diagnostic trouble code (DTC) • Anti-lock braking system ○ Fluid leakage ○ Air leakage ○ Wear and tear ○ Oxidation/corrosion ○ Fuse ○ Breakage ○ Damage ○ Open/short circuit ○ Continuity ○ Voltage ○ Ampere ○ Resistance ○ Hydraulic pump pressure ○ Inlet and outlet valve ○ Malfunction indicator lamp (MIL) ○ Diagnostic trouble code (DTC)
Components	*May include but not limited to:*

	• Charging system
	  ○ Battery
	  ○ Stator coil
	  ○ Fly wheel magneto
	  ○ Regulator rectifier unit
	  ○ Wiring harness
	  ○ Fuse
	  ○ Ignition switch
	• Self-starting system
	  ○ Ignition switch
	  ○ 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
	  ○ Fuse

	○ Spark plug/plug cap ○ Stator coil ○ Fly wheel magneto ○ Pickup coil ○ CDI/ECU ○ Ignition coil ○ Side stand switch ○ Wiring harness and connectors • Lighting system ○ Ignition switch ○ Light switch ○ Battery ○ Fuse ○ Relay ○ Flasher relay ○ Buzzer ○ Coil ○ Head light ○ Parking light ○ Tail light ○ Side light ○ Brake light ○ Neutral light ○ Instrument panel ○ Horn ○ Wiring harness and connectors • Electronic fuel injection system ○ Ignition switch ○ Battery ○ Fuse ○ ECU ○ Throttle body

	○ Canister ○ Sensors: MAP, intake air temperature, engine oil temperature sensor, throttle position sensor, lean/bank angle sensor, crankshaft position sensor, O2 ○ 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 ○ Battery ○ Fuse ○ Hydraulic electronic control unit (HECU) ○ Rotor/encoder ○ Wheel speed sensor ○ Wiring harness and connectors ○ Brake master cylinder ○ Brake fluid reservoir ○ Brake hose pipe ○ Calliper ○ Brake discs ○ Brake pad
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