National Occupational Skill Standard (NOSS)

Occupational Title : **Light Vehicle Service Mechanic**

Level : **1**

Sector : **Automobile Engineering**

Sub - Sector : **Four 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: 2020-02-24 (2076-11-11)

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Approved by the tripartite National Skill Testing Board.
1989

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Approved by the tripartite National Skill Testing Board.
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The National Skill Standard and Test was Revised by:

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1	**Occupational Title: Light Vehicle Service Mechanic** **Level: 1**
2	**Job Description:** Light Vehicle Service Mechanic, L-1 performs general servicing of electrical and mechanical systems of light vehicles.
3	**UNITS OF COMPETENCY:** 1. Perform general servicing. 2. Perform electrical servicing. 3. Perform communication. 4. Develop professionalism. ***Note: Unit 3 and 4 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: 4 to 6 Hrs • Recommended Group Size: 6 to 8 candidates

5	**Unit No:1** **Unit Title: Perform general servicing**	**Unit code:**

Elements of competency	Performance standards
1.1 Prepare tools and equipment	1.1.1 ***Personal protective equipment (PPE)*** checked for damages and fittings. 1.1.2 Personal protective equipment used in accordance with organization standard. 1.1.3 Tools, equipment and materials checked and collected as per task requirement.
1.2 Lubricate chassis	1.2.1 Lubricating equipment's filled with lubricants. 1.2.2 Greasing points located and foreign particles removed from greasing point. 1.2.3 Grease applied on greasing point until existing grease is replaced by new. 1.2.4 Excess grease cleaned from vehicle body/components.
1.3 Change engine oil and filter	1.3.1 Oil leakage and level checked. 1.3.2 Engine oil drained in normal operating temperature in a container without spillage. 1.3.3 Drain plug cleaned and installed along with new washer. 1.3.4 Engine oil filter replaced with new one after filling engine oil in the filter. 1.3.5 ***Specified grade*** of engine oil refilled to specified level. 1.3.6 Engine oil level checked to ensure oil filled to prescribed level. 1.3.7 Spilled oil cleaned from engine.
1.4 Change transmission oil	1.4.1 Filler plug and drain plug removed. 1.4.2 Transmission oil drained in normal operating temperature in a container without spillage. 1.4.3 Drain plug cleaned and installed along with new washer. 1.4.4 ***Specified grade*** of transmission oil refilled to specified level. 1.4.5 Filler plug installed. 1.4.6 Spilled oil cleaned from transmission.
1.5 Change steering oil	1.5.1 Steering box filter plug/reservoir cap removed. 1.5.2 Steering oil drained in a container without spillage. 1.5.3 ***Specified grade*** of steering oil refilled to specified level.

		1.5.4 Air removed from hydraulic system. 1.5.5 Steering oil level checked to ensure oil filled to prescribed level. 1.5.6 Filler plug/reservoir cap installed without damaging box/reservoir and plug.
	1.6 Change coolant	1.6.1 Radiator pressure cap removed. 1.6.2 Coolant level and leakage checked. 1.3.8 Coolant drained in a container without spillage. 1.6.3 ***Specified grade*** of coolant refilled to specified level. 1.6.4 Air removed from cooling system. 1.6.5 Coolant level checked to ensure coolant filled to prescribed level. 1.6.6 Radiator pressure cap installed.
	1.7 Change air filter	1.7.1 Air filter cover removed. 1.7.2 Air filter removed and housing cleaned. 1.7.3 Condition of air filter/sealing surfaces checked and reported verbally/in writing. 1.7.4 Air filter elements inserted into housing with rubber rim facing up and edges sealed without air leakage. 1.7.5 Filter cover refitted.
	1.8 Perform spark plug servicing	1.8.1 High tension cables disconnected. 1.8.2 Spark plug removed without damaging seal and thread. 1.8.3 Condition of spark plug checked. 1.8.4 Spark plug gap cleaned and adjusted in accordance with workshop manual. 1.8.5 Spark plug refitted/replaced without damaging seal and thread. 1.8.6 High tension cable connected as per firing order.
	1.9 Perform brake system servicing	1.9.1 Vehicles lifted following ***proper safety measures.*** 1.9.2 ***Braking system components*** dismantled in sequential order. 1.9.3 Braking system components checked visually for ***damage*** and reported. 1.9.4 New braking system components installed in accordance with workshop manual. 1.9.5 Braking system components assembled in sequential order.

		1.9.6 Level of brake fluid and leakage checked and topped up to specified level. 1.9.7 Air removed from the system in accordance with workshop manual. 1.9.8 Wheel nuts tightened as specified. 1.9.9 Brake shoes adjusted in accordance with workshop manual.
	1.10 Perform suspension system servicing	1.10.1 ***Suspension system components*** removed in sequential order. 1.10.2 Suspension system components checked visually for damage and reported. 1.10.3 Faulty suspension system components replaced by new component in accordance with workshop manual. 1.10.4 Suspension system components assembled in sequential order.
	1.11 Change fuel filter	1.11.1 Fuel filter removed. 1.11.2 Fuel filter replaced with rubber seal seated properly without air leakage. 1.11.3 Air removed from fuel system.
	1.12 Maintain tyre air pressure	1.12.1 Air pressure checked in tyre. 1.12.2 Tyre Inflated as per tyre pressure specification. 1.12.3 Tyre air pressure checked and adjusted.
	1.13 Store tools and equipment	1.13.1 Work area cleaned. 1.13.2 Tools and equipment cleaned, checked and stored in designated place. 1.13.3 Waste disposed as per workshop standard operating procedure.
6	**Task Performance Requirements (Tools, Equipment and Materials):** • Vehicle, workshop manual, grease gun, grease, greasing nipple, air filter, spark plug, spark plug wrench, spark plug cleaner, feeler gauge, sand paper, pliers, engine oil, transmission oil, brake fluid, coolant, oil filter, ring spanner, wrench set, hammer, spring compressor, ball joint puller, strap wrench, screw driver, oil container, kerosene, cloth, seal gasket, fuel filter, tyre pressure gauge, air compressor, cleaning tools, cleaning materials 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 and chemical hazard. • Safe disposal of waste.

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

	• Tools and equipment
	  ○ Use and application
	  ○ Handling technique
	  ○ Safety measures
	• Importance of PPE
	• Occupational Health and Safety rules and regulation
	• National classification of light vehicle
	• Basic understanding of:
	  ○ Engine
	  ○ Transmission
	  ○ Suspension
	  ○ Brake
	  ○ Steering
	  ○ Electrical system
	• Types and uses of:
	  ○ Engine oil
	  ○ Transmission oil
	  ○ Hydraulic oil
	  ○ Brake fluid
	  ○ Coolant
	  ○ Grease
	• Consequences of using chocked/damaged air filter
	• Spark plug
	  ○ Types
			• Read and interpret workshop manual

	○ Operation of ignition system ○ Plug gap • Brake system ○ Types ○ Operation ○ Components ○ Brake pedal free play ○ Adjustment ○ Air bleeding • Suspension system ○ Types ○ Operation ○ Components • Fuel filter ○ Types ○ Operation of fuel system ○ Fuel system components ○ Air bleeding • Tyre ○ Types ○ Air pressure ○ Consequences of incorrect tyre pressure		

9	**Assessment of Competency**					
	Unit: 2 **Unit Title: Perform general servicing**					
	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 and equipment	1.1.1 ***Personal protective equipment (PPE)*** checked for damages and fittings. 1.1.2 Personal protective equipment used in accordance with organization standard. 1.1.3 Tools, equipment and materials checked and collected as per task requirement.				
1.2 Lubricate chassis	1.2.1 Lubricating equipment's filled with lubricants. 1.2.2 Greasing points located and foreign particles removed from greasing point. 1.2.3 Grease applied on greasing point until existing grease is replaced by new. 1.2.4 Excess grease cleaned from vehicle body/components.				
1.3 Change engine oil	1.3.1 Oil leakage and level checked.				

and filter	1.3.2 Engine oil drained in normal operating temperature in a container without spillage. 1.3.3 Drain plug cleaned and installed along with new washer. 1.3.4 Engine oil filter replaced with new one after filling engine oil in the filter. 1.3.5 ***Specified grade*** of engine oil refilled to specified level. 1.3.6 Engine oil level checked to ensure oil filled to prescribed level. 1.3.7 Spilled oil cleaned from engine.				
1.4 Change transmission oil	1.4.1 Filler plug and drain plug removed. 1.4.2 Transmission oil drained in normal operating temperature in a container without spillage. 1.4.3 Drain plug cleaned and installed along with new washer. 1.4.4 ***Specified grade*** of transmission oil refilled to specified level. 1.4.5 Filler plug installed. 1.4.6 Spilled oil cleaned from transmission.				
1.5 Change steering oil	1.5.1 Steering box filter plug/reservoir cap removed. 1.5.2 Steering oil drained in a container without spillage. 1.5.3 ***Specified grade*** of steering oil refilled to specified level. 1.5.4 Air removed from hydraulic system. 1.5.5 Steering oil level checked to ensure oil filled to prescribed level.				

	1.5.6 Filler plug/reservoir cap installed without damaging box/reservoir and plug.				
1.6 Change coolant	1.6.1 Radiator pressure cap removed. 1.6.2 Coolant level and leakage checked. 1.3.8 Coolant drained in a container without spillage. 1.6.3 ***Specified grade*** of coolant refilled to specified level. 1.6.4 Air removed from cooling system. 1.6.5 Coolant level checked to ensure coolant filled to prescribed level. 1.6.6 Radiator pressure cap installed.				
1.7 Change air filter	1.7.1 Air filter cover removed. 1.7.2 Air filter removed and housing cleaned. 1.7.3 Condition of air filter/sealing surfaces checked and reported verbally/in writing. 1.7.4 Air filter elements inserted into housing with rubber rim facing up and edges sealed without air leakage. 1.7.5 Filter cover refitted.				
1.8 Perform spark plug servicing	1.8.1 High tension cables disconnected. 1.8.2 Spark plug removed without damaging seal and thread. 1.8.3 Condition of spark plug checked. 1.8.4 Spark plug gap cleaned and adjusted in accordance with workshop manual. 1.8.5 Spark plug refitted/replaced without damaging seal and thread. 1.8.6 High tension cable connected as per firing order.				

1.9 Perform brake system servicing	1.9.1 Vehicles lifted following ***proper safety measures.*** 1.9.2 ***Braking system components*** dismantled in sequential order. 1.9.3 Braking system components checked visually for ***damage*** and reported. 1.9.4 New braking system components installed in accordance with workshop manual. 1.9.5 Braking system components assembled in sequential order. 1.9.6 Level of brake fluid and leakage checked and topped up to specified level. 1.9.7 Air removed from the system in accordance with workshop manual. 1.9.8 Wheel nuts tightened as specified. 1.9.9 Brake shoes adjusted in accordance with workshop manual.				
1.10 Perform suspension system servicing	1.10.1 ***Suspension system components*** removed in sequential order. 1.10.2 Suspension system components checked visually for damage and reported. 1.10.3 Faulty suspension system components replaced by new component in accordance with workshop manual. 1.10.4 Suspension system components assembled in sequential order.				
1.11 Change fuel filter	1.11.1 Fuel filter removed. 1.11.2 Fuel filter replaced with rubber seal seated properly				

	without air leakage. 1.11.3 Air removed from fuel system.				
1.12 Maintain tyre air pressure	1.12.1 Air pressure checked in tyre. 1.12.2 Tyre Inflated as per tyre pressure specification. 1.12.3 Tyre air pressure checked and adjusted.				
1.13 Store tools and equipment	1.13.1 Work area cleaned. 1.13.2 Tools and equipment cleaned, checked and stored in designated place. 1.13.3 Waste disposed as per workshop standard operating procedure.				

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

Specified grade	*May include but not limited to:*
	• Engine oil
	  ○ 5W-30
	  ○ 5W-40
	  ○ 0W-30
	  ○ 15W-40
	• Transmission oil
	  ○ 80W-90
	  ○ 85W-120
	• Steering oil
	  ○ 5W-30
	  ○ 5W-40
	  ○ 10W-40
	• Coolant
	  ○ 5W-30
	  ○ 5W-40
	  ○ 10W-40

Proper safety measures	*May include but not limited to:* • Use of hand brakes • Use of safety locks • Use of wheel chocks
Braking system components	*May include but not limited to:* • Brake drum/disc • Brake shoe/pad • Caliper
Damage	*May include but not limited to:* • Crack • Wear and tears • Leakage • Adjustment • Spring tension
Suspension system components	*May include but not limited to:* • Arm bush • Shock absorber • Coil spring • Torsion bar • Leaf spring • Stabilizer bar • Strut

5	**Unit No: 2** **Unit Title: Perform electrical servicing**	**Unit code:**

Elements of competency	Performance standards
2.1 Prepare tools and equipment	2.1.1 ***Personal protective equipment (PPE)*** checked for damages and fittings. 2.1.2 Personal protective equipment used in accordance with organization standard. 2.1.3 Tools, equipment and materials checked and collected as per task requirement.
2.2 Perform battery servicing	2.2.1 ***Battery condition*** checked and reported. 2.2.2 Alkali deposited removed from battery terminals. 2.2.3 Distilled water topped up to specified level. 2.2.4 Battery charged to specified specific gravity of electrolyte. 2.2.5 Faulty battery replaced with new one.
2.3 Change electrical components	2.3.1 ***Electrical components condition*** checked and reported. 2.3.2 Faulty ***electrical components*** removed without damaging other components. 2.3.3 Electrical components replaced with new one.
2.4 Store tools and equipment	2.4.1 Work area cleaned. 2.4.2 Tools and equipment cleaned, checked and stored in designated place. 2.4.3 Waste disposed as per workshop standard operating procedure.

6	**Task Performance Requirements (Tools, Equipment and Materials):** • Screw driver set, pliers, wire cutter, spanner set, battery charger, hydrometer, multimeter, distilled water, bulb, fuse, relay and PPE.
7	**Safety and Hygiene (Occupational Health and Safety):** • Use Personal Protective Equipment (PPE). • Safe handling of tools and equipment. • Avoid slippery floor. • Avoid electrical and chemical hazard.

	• Safe disposal of waste.

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

	• Tools and equipment
	  ○ Use and application
	  ○ Handling technique
	  ○ Safety measures
	• Basic electrical symbols and circuit diagram
	• Current, voltage, resistance and their relationship
	• Conductor and insulator
	• Battery
	  ○ Types
	  ○ Connection
	  ○ Basic operation
	• Introduction of electrical components
	  ○ Wire and color coding
	  ○ Alternator
	  ○ Starter motor
	  ○ Ignition switch
	  ○ Sensors
	  ○ Actuators
	  ○ Electronic Control Unit (ECU)
	  ○ Motor
	  ○ Horns
	  ○ Switch
	  ○ Lighting system
	  ○ Fuse box
	  ○ Instrument cluster
		• Calculate current, voltage and resistance	• Read and interpret basic electrical circuit diagram

9	**Assessment of Competency**					
	Unit: 2 **Unit Title: Perform electrical servicing**					
	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)*** checked for damages and fittings. 2.1.2 Personal protective equipment used in accordance with organization standard. 2.1.3 Tools, equipment and materials checked and collected as per task requirement.				
2.2 Perform battery servicing	2.2.1 ***Battery condition*** checked and reported. 2.2.2 Alkali deposited removed from battery terminals. 2.2.3 Distilled water topped up to specified level. 2.2.4 Battery charged to specified specific gravity of the electrolyte. 2.2.5 Faulty battery replaced with new one.				
2.3 Change electrical components	2.3.1 ***Electrical components*** condition checked and reported. 2.3.2 Faulty electrical components removed without damaging other components. 2.3.3 Electrical components replaced with new one.				

2.4 Store tools and equipment	2.4.1 Work area cleaned. 2.4.2 Tools and equipment cleaned, checked and stored in designated place. 2.4.3 Waste disposed as per workshop standard operating procedure.				

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
Battery condition	*May include but not limited to:* • Physical damage • Electrolyte level • Specific gravity • Open circuit voltage
Electrical components	*May include but not limited to:* • Bulb • Fuse • Relay
Electrical components condition	*May include but not limited to:* • Physical damage • Blown fuse • Burnt bulb • Operation of relay