JOB SPECIFICATION
AND
SKILLS TEST

JOB TITLE	:	**Heavy Vehicle Mechanic, L - 2**
SECTOR	:	**Mechanical Engineering**
SUB-SECTOR	:	**Automotive**

Council For Technical Education and Vocational Training
National Skills Testing Board
Kathmandu, Nepal
1997 (2053/054)

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Approved by the Tripartite National Skills Testing Board.

1997

JOB SPECIFICATION

1.	**JOB TITLE : Heavy Vehicle Mechanic** **LEVEL : 2**
2.	**JOB DESCRIPTION** **The Heavy Vehicle Mechanic services/repairs/replaces parts and adjusts/tests components of heavy vehicles above three tons.**
3.	**LIST OF TASK** 1. Servicing/repairing cooling system. 2. Servicing /repairing injectors. 3. Servicing /repairing/testing clutch system. 4. Servicing /repairing propeller shaft and universal joints 5. Repairing exhaust system. 6. Servicing/repairing /testing drum type brakes. 7. Servicing/repairing/testing mechanical parking brake on gear box/propeller shaft. 8. Servicing/repairing/testing mechanical parking brake on wheel. 9. Servicing /repairing feed pump. 10. Replacing leaf springs. 11. Testing shock absorbers. 12. Servicing/repairing steering linkage. 13. Servicing /repairing steering box. 14. Servicing wheel bearings.
4.	**QUALIFYING NOTES (entry requirements, etc.)** **- Normal health.** ■ **Educational requirements : able to read and write. Understand specifications and interpret manufacturer's specification and workshop manual.**

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TASK SPECIFICATION

5.

TASK TITLE : Servicing /repairing cooling system.

TASK No. :1 **JOB TITLE : Heavy Vehicle Mechanic, L-2**

6.

TASK ELEMENTS

1.1 Receives verbal/written instructions.
1.2 Dons protective clothing.
1.3 Selects appropriate tools and equipment.
1.4 Inspects and reports on condition of water pump, hoses and radiator.
1.5 Checks for water leaks.
1.6 Inspects and reports on condition of fan belt.
1.7 Drains water.
1.8 Removes radiator, fan belt/fan pulley, water hoses, water pump and thermostat valve.
1.9 Dismantles water pump.
1.10 Removes bearings using bearing puller/hydraulic press.
1.11 Replaces damaged/worn components of water pump.
1.12 Reassembles water pump.
1.13 Tests operation of thermostat valve.
1.14 Refits water pump/thermostat valve, fan pulley, radiator and fills water with coolant.
1.15 Replaces damaged/worn fan belt.
1.16 Adjusts/fan belt tension.
1.17 Refits/replaces water hoses.
1.18 Checks proper functioning of cooling system.
1.19 Cleans and returns tools and equipment.

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TASK SPECIFICATION

7.	**TASK PERFORMANCE REQUIREMENTS** A vehicle , workshop manual, spare parts book, open ended/ring/socket spanners, screwdrivers (Flat/Phillips), pliers, puller, hydraulic press, radiator pressure tester, torque wrench, vernier caliper with depth gauge, micrometer, mercury thermometer (up to 100 - 125 degree centigrade) hammer, ruler, tape, special tools as recommended by the manufacturer, container for waste water, replacement components such as fan belt/water pump components/water hoses etc., cleaning brush, cotton, jute, kerosene, waste rags.
8.	**TASK PERFORMANCE STANDARDS** Mechanic dressed in appropriate safety clothing. Appropriate tools and equipment selected. Faulty/inefficient/damaged parts of water pump and hoses identified and reported. Water leakage identified with pressure tester as specified. Damaged/worn condition of fan belt identified and reported. Radiator water drained in container without spilling. Radiator, fan belt/fan pulley, water hoses/water pump, and thermostat valve removed as specified without damage. Water pump dismantled as specified without damage. Bearing removed using bearing puller/hydraulic press. Damaged/worn components of water pump replaced as specified without damage. Water pump reassembled without damage. Thermostat performance tested as specified. Water pump/thermostat valve and fan pulley refitted as specified without damage. Damaged/worn fan belt replaced as specified. Fan belt tension adjusted to specified tension using ruler/tape. Water hoses refitted, replaced as required . Water with coolant refilled as required. Cooling system checked as specified without damaging its components. No water leakage after checking with pressure tester as specified. Tools and equipment cleaned and returned to specified place.

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9	10	TASK TRAINING DATA			
Task No.	**T.E. No**	**TECHNICAL KNOWLEDGE**	**APPLIED CALCULATIONS**	**GRAPHIC INFORMATION**	**SAFETY and HYGIENE**
1				Reading and interpretation of manufacturer's specifications, workshop manual and parts catalogue.	First aid:- practicing and reporting. Importance of using safety clothing.
	3.	Knowledge of types/use and care of tools and equipment such as open ended/ring/socket spanners, screwdrivers, pliers, pullers, hydraulic press, radiator pressure tester.			Hazards involved in using tools and equipment.
	4.	Knowledge of function of the radiator assembly, water pump and hoses.			
	5.	Knowledge of checking procedure of coolant leaks and condition of radiator cap/radiator.			Consequence of using improper tools/using tools improperly.
	6.	Knowledge of applications of fan belts. Procedures of inspecting and reporting condition of fan belts.			
	7.	Knowledge of draining procedure of water.			
	8.	Knowledge of dismantling procedure of water pump.			
	9.	Knowledge of identifying procedure and replacing procedure of damaged/worn parts of water pump.		Identifying the components indicated in pictorial view.	
	10.	Knowledge of reassembling procedure of water pump.			
	11.	Knowledge of temperature scales/measurement. Knowledge of types, function and operation of thermostat valve and procedure for testing thermostat valve.			

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9	10	TASK TRAINING DATA			
Task No.	T.E. No	TECHNICAL KNOWLEDGE	APPLIED CALCULATIONS	GRAPHIC INFORMATION	SAFETY and HYGIENE
1					
	12.	Knowledge of refitting procedure of water pump/thermostat valve and fan pulley.			
	13.	Knowledge of replacing procedure of damaged/worn fan belt.			
	14.	Knowledge of adjusting procedure of fan belt tension.			
	15.	Knowledge of refitting/replacing procedure of radiator, water hoses and filling water with coolant.			
	16.	Knowledge of checking procedure of cooling system.			
	17.	Knowledge of rechecking procedure of water leaks.			
	18.	Knowledge of cleaning used tools and equipment and returning them to specified locations.			
	19.	Knowledge of special tools recommended by manufacturer's specification.			

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TASK PERFORMANCE TEST (skill assessment)

11	**TASK TITLE :** **Servicing/repairing cooling system.** **TASK No. :** **1**	**LOCATION OF TEST** **CANDIDATE'S NAME** **EVALUATOR'S NAMES**

12	TEST FACTORS AND ITEMS	STANDARD MET	STANDARD NOT MET (Comments)
	DID THE CANDIDATE ? 1.1 Dress in appropriate safety clothing. 1.2 Select the appropriate tools and equipment. 1.3 Inspect and report on condition of faulty/inefficient/damaged components of water pump, hoses, radiator and thermostat valve. 1.4 Check water leaks as specified with pressure tester. 1.5 Inspect and report on condition of damaged/worn fan belt. 1.6 Drain water into container without spilling. 1.7 Remove radiator, fan belt/fan pulley/water hoses water pump and thermostat valve as specified without damage. 1.8 Dismantle water pump as specified without damage. 1.9 Remove bearings using bearing puller/hydraulic press. 1.10 Replace damaged/worn components of water pump as specified without damage. 1.11 Reassemble water pump without damage. 1.12 Test operation of thermostat valve as specified. 1.13 Refit water pump/thermostat valve, fan pulley and radiator as specified without damage.		

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TASK PERFORMANCE TEST (skill assessment)

11	**TASK TITLE :** **Servicing/repairing cooling system.** **TASK No. :** **1**	**LOCATION OF TEST** **CANDIDATE'S NAME** **EVALUATOR'S NAMES**

12	TEST FACTORS AND ITEMS	STANDARD MET	STANDARD NOT MET (Comments)
	DID THE CANDIDATE ? 1.14 Replace damaged/worn fan belt as specified. 1.15 Adjust fan belt tension as specified tension with ruler/tape. 1.16 Refit /replace water hose and refill water with coolant as required. 1.17 Recheck water leaks with pressure tester as specified. No water leakage after checking. 1.18 Check cooling system as specified. 1.19 Clean used tools and equipment and return to specified place. 1.20 Complete the job within specified time.		

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TASK SPECIFICATION

5.	**TASK TITLE : Servicing /repairing injectors.** **TASK No. :2** **JOB TITLE : Heavy Vehicle Mechanic, L-2**
6.	**TASK ELEMENTS** 2.1 Receives verbal/written instructions. 2.2 Dons protective clothing. 2.3 Selects appropriate hand tools and equipment. 2.4 Disconnects high pressure pipes (nozzle pipes). 2.5 Removes injectors. 2.6 Checks and reports condition of seats/sealing rings of injectors. 2.7 Prepares injector tester. 2.8 Tests injectors. 2.9 Reports condition of injectors. 2.10 Dismantles injectors. 2.11 Cleans nozzles. 2.12 Checks/reports condition of nozzles. 2.13 Replaces nozzles. 2.14 Assembles injectors. 2.15 Re-tests injectors. 2.16 Refits injectors. 2.17 Connects high pressure pipes (nozzle pipes). 2.18 Bleeds air. 2 19 Tests operation of injectors. 2.20 Cleans and returns tools and equipment.

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TASK SPECIFICATION

7.	**TASK PERFORMANCE REQUIREMENTS** A diesel engine, workshop manual, spare parts book, open ended/ring/socket spanners, screwdrivers, pliers, hammers, an injector tester, injector cleaning kits, injector spanners, replacement components such as sealing ring/nozzles/injectors etc., cotton cloth, cleaning brush, kerosene, vernier caliper, micrometer, special tools as recommended by the manufacturer.
8.	**TASK PERFORMANCE STANDARDS** Mechanic dressed in appropriate safety clothing. Appropriate tools and equipment selected. High pressure pipe disconnected from injectors as specified without damage. Injector's removed as specified without damage. Faulty/damaged injector seat/sealing ring identified and reported. Injector tester prepared as specified. Spray pattern test of injector performed as specified. Faulty/damaged injectors reported. Injectors dismantled as specified without damage. Dirt/iron particles and foreign materials cleaned from nozzles with cleaning tools. Damaged/faulty/inefficient nozzles identified and reported. Nozzles replaced as specified. Injectors assembled as specified without damage. Pressure/spray pattern of injector retested as specified. Injectors refitted to the engine as specified without damaging injectors seat and sealing ring High pressure pipes connected as specified without damage. Absence of air bubbles after bleeding the diesel fuel system. Injectors operation tested with running engine as per manufacturer's specifications. Used tools and equipment cleaned and returned to specified place.

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9	10	TASK TRAINING DATA			
Task No.	T.E. No	TECHNICAL KNOWLEDGE	APPLIED CALCULATIONS	GRAPHIC INFORMATION	SAFETY and HYGIENE
2				Reading and interpretation of manufacturer's specifications, workshop manual and parts catalogue.	First aid:- practicing and reporting.
					Importance of using safety clothing.
	3.	Knowledge of types/use and care of hand tools and equipment such as open ended/ring/socket spanners, pliers, screwdrivers, hammers injector tester, injector cleaning kit, injector spanner, vernier caliper, micrometer, special tools etc.			
	4.	Knowledge of disconnecting procedure of high pressure pipes.			Hazards involved in using tools and equipment.
	5.	Knowledge of removing procedure of injectors.		Identify the components indicated in pictorial view.	
	6.	Knowledge of checking and reporting of injector seat and sealing ring condition.			
	7.	Knowledge of preparation of injector tester.			
	8.	Knowledge of spray patterns and testing procedure of injectors.			Consequence of using improper tools/using tools improperly.
	9.	Knowledge of dismantling procedure of injectors.			
	10.	Knowledge of cleaning procedure of injectors.			
	11.	Knowledge of types, application and operation of injector nozzles. Checking and reporting procedure of nozzles condition.			
	12.	Knowledge of replacing procedure of nozzles.			
	13.	Knowledge of assembling procedure of injectors.			
	14.	Knowledge of re-testing procedure of injectors.			

9	10	TASK TRAINING DATA			
Task No.	T.E. No	TECHNICAL KNOWLEDGE	APPLIED CALCULATIONS	GRAPHIC INFORMATION	SAFETY and HYGIENE
2	15.	Knowledge of refitting procedure of injectors.			
	16.	Knowledge of connecting procedure of high pressure pipes.			
	17.	Knowledge of bleeding procedure of air from the diesel fuel system.			
	18.	Knowledge of testing procedure of injectors operation by running engine.			Hazards involved in running engine.
	19.	Knowledge of cleaning used tools and returning them to specified location.			Hazards involved in running engine in close garage.

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TASK PERFORMANCE TEST (skill assessment)

	TASK TITLE : Servicing/repairing injectors.	**LOCATION OF TEST** **CANDIDATE'S NAME**
11	**TASK No. : 2**	**EVALUATOR'S NAMES**

12	**TEST FACTORS AND ITEMS**	**STANDARD MET**	**STANDARD NOT MET (Comments)**
	DID THE CANDIDATE ? 2.1 Dress in appropriate safety clothing. 2.2 Select the appropriate hand tools and equipment. 2.3 Disconnect high pressure pipes from injectors as specified without damage. 2.4 Remove injectors as specified without damaging seats and sealing rings. 2.5 Identify and report condition of faulty/damaged seats/sealing rings. 2.6 Prepare injector tester as specified. 2.7 Test pressure and spray patterns of injectors as specified. 2.8 Report condition of faulty/damaged injectors. 2.9 Dismantle injectors as specified without damage. 2.10 Clean dirt/iron particles from nozzles using cleaning tools. 2.11 Identify/report condition of faulty/inefficient and damaged nozzles.		

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TASK PERFORMANCE TEST (skill assessment)

	TASK TITLE : **Servicing/repairing injectors.**	**LOCATION OF TEST**
		CANDIDATE'S NAME
11	**TASK No. :** **2**	**EVALUATOR'S NAMES**

12	**TEST FACTORS AND ITEMS**	**STANDARD MET**	**STANDARD NOT MET (Comments)**
	DID THE CANDIDATE ? 2.12 Replace nozzles as specified. 2.13 Assemble injectors as specified without damage. 2.14 Retest injector's spray patterns and pressure as specified. 2.15 Refit injectors to the engine as specified without damaging seats and sealing rings. 2.16 Connect high pressure pipes as specified without damage. 2.17 Bleed air from the diesel fuel system. 2.18 Test operation of injectors with running engine. 2.19 Clean used tools and equipment and return to specified place. 2.20 Complete the job within specified time.		

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TASK SPECIFICATION

5.	**TASK TITLE : Servicing /repairing testing clutch system.** **TASK No. :3** **JOB TITLE : Heavy Vehicle Mechanic, L-2**
6.	**TASK ELEMENTS** 3.1 Receives verbal/written instructions. 3.2 Dons protective clothing. 3.3 Selects appropriate hand tools, special tools and equipment. 3.4 Checks and reports condition of clutch. 3.5 Jacks up vehicle if necessary. 3.6 Removes transmission case and clutch assembly. 3.7 Checks and reports condition of clutch components, including pilot bearing and top shaft. 3.8 Changes clutch plate lining and pressure plate as applicable. 3.9 Replaces and refits releases bearing, clutch assembly and transmission. 3.10 Adjusts clutch pedal free play. 3.11 Jacks down vehicle if necessary. 3.12 Tests clutch operation. 3.13 Cleans and returns tools.

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TASK SPECIFICATION

7.	**TASK PERFORMANCE REQUIREMENTS** A vehicle, workshop manual, spare parts book, jack/stands, open ended/ring/socket spanners, screwdrivers, pliers, hammers, clutch plate/lining, pressure plate, transmission case, clutch housing release bearing, clutch aligning tool set, gearbox jack, feeler gauge, surface plate, special tools as recommended by the manufacturer, cleaning brush, kerosene, jute/waste rags, goggles, gloves, cotton clothes.
8.	**TASK PERFORMANCE STANDARDS** Mechanic dressed in appropriate safety clothing. Appropriate tools and equipment selected. Condition of clutch operation checked and reported. Vehicle jacked up safely if necessary. Transmission case/clutch assembly removed as specified without damaging transmission/clutch components. Condition of clutch components/pilot bearing checked and reported. Clutch plate lining, pressure plate and pilot bearing changed as specified without any damage. Release bearing/clutch assembly replaced and refitted as specified without any damage. Clutch pedal free play adjusted at specified clearance. Vehicle downed safely, if necessary, and jack/stands removed. Clutch serviced/repaired/replaced/adjusted and tested for desired performance as per manufacturer' specifications. Used tools cleaned and returned to specified place.

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9	10	TASK TRAINING DATA			
Task No.	**T.E. No**	**TECHNICAL KNOWLEDGE**	**APPLIED CALCULATIONS**	**GRAPHIC INFORMATION**	**SAFETY and HYGIENE**
3	**1.**	Knowledge and use of workshop manual, diagram and parts catalogue.			First aid:- practicing and reporting.
	2.	Knowledge of application of protective clothing.			Importance of using safety clothing.
	3.	Knowledge of care and use of hand tools and equipment such as jack/stands, open ended/ring/ socket spanners, screwdrivers, pliers, hammers, clutch aligning tool, gearbox jack, special tools.		Reading and interpretation of manufacturer's specifications, workshop manual and parts catalogue.	Hazards involved in using tools and equipment.
	4.	Knowledge of location, types and operation of clutch and procedure of checking operation, condition and reporting procedures.			Consequence of using improper tools/using tools improperly.
	5.	Knowledge of identification of jacking points and jacking procedure.			Hazards involved in jacking vehicle and working under jacked vehicle.
	6.	Knowledge of removing procedure of transmission case and clutch assembly.		Identify the components indicated in pictorial view.	
	7.	Knowledge of location of clutch components and procedure of checking clutch components, pilot bearing and top shaft.			
	8.	Knowledge of drilling/riveting machine and changing clutch plate lining procedures.			
	9.	Knowledge of replacing/refitting release bearing, clutch assembly, pilot bearing and transmission.			
	10.	Knowledge of jacking down vehicle and removing procedure of jack/stands.			
	11.	Knowledge of testing procedure of clutch free play and clutch operation.			
	12.	Knowledge of cleaning used tools and returning them to specified location.			Hazards involved in running engine.

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TASK PERFORMANCE TEST (skill assessment)

11	**TASK TITLE :** **Servicing/repairing/testing clutch system.** **TASK No. :** **3**	**LOCATION OF TEST** **CANDIDATE'S NAME** **EVALUATOR'S NAMES**

12	TEST FACTORS AND ITEMS	STANDARD MET	STANDARD NOT MET (Comments)
	DID THE CANDIDATE ? 3.1 Dress in appropriate safety clothing. 3.2 Select the appropriate hand tools and equipment. 3.3 Check and report condition of clutch operation as per instruction. 3.4 Jack up vehicle safely. 3.5 Remove transmission case and clutch assembly as specified without damaging transmission case and clutch components. 3.6 Check and report condition of clutch components, pilot bearing, and top shaft as per instruction. 3.7 Change clutch plate lining and pressure plate as specified without damaging new clutch plate lining. 3.8 Replace/refit release bearing, clutch assembly, transmission and pilot bearing as specified without damaging its components. 3.9 Adjust clutch pedal free play at specified clearance. 3.10 Jack down vehicle safely and remove jack/stands. 3.11 Test clutch operation service/repair/replace and adjust for desired performance as per manufacturer's specification. 3.12 Clean used tools and return to specified place. 3.13 Complete the job within specified time.		

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TASK SPECIFICATION

5.	**TASK TITLE : Servicing /repairing propeller shaft and universal joints.** **TASK No. :4** **JOB TITLE : Heavy Vehicle Mechanic, L-2**
6.	**TASK ELEMENTS** 4.1 Receives verbal/written instructions. 4.2 Dons protective clothing. 4.3 Selects appropriate hand tools. 4.4 Checks and reports on condition of propeller shaft components 4.5 Removes propeller shaft, cross spider, center bearing, center bearing rubber, center bearing housing, center bearing bracket and yoke. 4.6 Identifies damaged/worn components of propeller shaft. 4.7 Replaces new cross spider, center bearing, cushion and oil seal. 4.8 Refits propeller shaft components. 4.9 Checks operation of propeller shaft. 4.10 Cleans and returns tools.

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TASK SPECIFICATION

7.	**TASK PERFORMANCE REQUIREMENTS** A vehicle with propeller shaft, workshop manual, spare parts book, jack/stands, open ended/ring/socket spanners, screwdriver, hammers, drifts, circlip pliers, combination pliers, vernier caliper, surface plate, magnetic stand, dial gauge, measuring tape, puller, replacement components, arbor press, cleaning brush, grease, cotton, kerosene, jute/waste rags.
8.	**TASK PERFORMANCE STANDARDS** Mechanic dressed in appropriate safety clothing. Appropriate hand tools selected. Propeller shaft condition checked and reported as instructed. Propeller shaft, cross spider, center bearing, center bearing rubber, center bearing housing, bearing bracket and yoke removed as instructed without damage. Damaged/inefficient/worn components of propeller shaft identified and necessary components replaced/refitted as per manufacturer's specifications. Propeller shaft assembly serviced/fitted/tested as per manufacturer's specifications. Used tools cleaned and returned to specified place.

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9	10	TASK TRAINING DATA			
Task No.	**T.E. No**	**TECHNICAL KNOWLEDGE**	**APPLIED CALCULATIONS**	**GRAPHIC INFORMATION**	**SAFETY and HYGIENE**
4	**1.**	Knowledge and use of workshop manual, diagram and parts catalogue.		Reading and interpretation of manufacturer's specifications, workshop manual and parts catalogue.	First aid:- practicing and reporting.
	2.	Knowledge of application of protective clothing.			Importance of using safety clothing.
	3.	Knowledge of types/care and use of hand tools such as open ended/ring/socket spanners, jack/stands, screwdrivers, circlip pliers, hammers, arbor press etc.			Hazards involved in using tools and equipment.
	4.	Knowledge of location, types and operation of propeller shaft and procedure of checking the condition of operation propeller shaft components. Cause of failure of cross spider, bearing, spline, bearing rubber etc.			Consequence of using improper tools/using tools improperly.
	5.	Knowledge of using arbor press for removing cross spider and knowledge of removing propeller shaft and cross spider			
	6.	Knowledge of replacing procedure of components of propeller shaft assembly.		Identify the propeller shaft joints parts on pictorial view.	
	7.	Knowledge of refitting propeller shaft procedure.			
	8.	Knowledge of checking procedure of components of propeller shaft.			
	9.	Knowledge of cleaning used tools and returning them to specified location.			Hazards involved in running engine.

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TASK PERFORMANCE TEST (skill assessment)

11	**TASK TITLE :** **Servicing/repairing propeller shaft and universal joints.** **TASK No. :** **4**		**LOCATION OF TEST** **CANDIDATE'S NAME** **EVALUATOR'S NAMES**
12	**TEST FACTORS AND ITEMS**	**STANDARD MET**	**STANDARD NOT MET (Comments)**
	DID THE CANDIDATE ? 4.1. Dress in appropriate safety clothing. 4.2. Select the appropriate hand tools. 4.3. Check and report condition of propeller shaft operation as per instructions. 4.4 Remove components of propeller shaft as per instruction. 4.5 Identify damaged/worn components of propeller shaft assembly. 4.6 Replace center bearing, rubber bracket, oil seals, yoke, housing as per manufacturer's specifications. 4.7 Refit propeller shaft components as per instruction without damage. 4.8 Check performance of serviced /repaired/replaced components as per manufacturer's specification. 4.9 Clean used tools and return to specified place. 4.10 Complete the job within specified time.		

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TASK SPECIFICATION

5. **TASK TITLE : Repairing exhaust system.**

TASK No. :5 **JOB TITLE : Heavy Vehicle Mechanic, L-2**

6. **TASK ELEMENTS**

5.1 Receives verbal/written instructions.
5.2 Dons protective clothing.
5.3 Selects appropriate hand tools and equipment.
5.4 Inspects and reports on condition of exhaust system.
5.5 Removes damaged parts of the exhaust system.
5.6 Replaces damaged parts of the exhaust system.
5.7 Checks exhaust system.
5.8 Cleans and returns tools and equipment.

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TASK SPECIFICATION

7.	**TASK PERFORMANCE REQUIREMENTS** A vehicle with exhaust system, workshop manual, open ended/ring/socket spanners, pliers, hammers, screwdrivers, drifts, replacement parts, cleaning brush, kerosene, cotton, jute/waste rags.
8.	**TASK PERFORMANCE STANDARDS** Mechanic dressed in appropriate safety clothing. Appropriate hand tools and equipment selected. Damaged parts of exhaust system identified and reported. Damaged parts of the exhaust system removed as specified. Damaged parts of the exhaust system replaced as specified. Exhaust system checked for gas leaks and no leakage allowed. Used tools and equipment cleaned and returned to specified place.

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9	10	TASK TRAINING DATA			
Task No.	**T.E. No**	**TECHNICAL KNOWLEDGE**	**APPLIED CALCULATIONS**	**GRAPHIC INFORMATION**	**SAFETY and HYGIENE**
5.				Reading and interpretation of manufacturer's specifications, workshop manual and parts catalogue.	First aid:- practicing and reporting. Importance of using safety clothing.
	3.	Knowledge of types, care and use of hand tools and equipment such as screwdrivers, pliers, open ended/ring/socket spanners, drifts, hammers, jack/stands.			Hazards involved in handling tools and equipment.
	4.	Knowledge of:- a) Application and operating characteristics of common exhaust system. Inspecting and reporting procedure of exhaust system condition..			
	5.	Knowledge of removing procedure of damaged parts of the exhaust system.			
	6.	Knowledge of replacing procedure of damaged parts of the exhaust system.			Hazards of toxic exhaust gases.
	7.	Knowledge of checking procedure of exhaust system for exhaust gas leaks.			Hazards involved in running engine.
	8.	Knowledge of cleaning used tools and returning to specified location.			

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TASK PERFORMANCE TEST (skill assessment)

11	**TASK TITLE :** **Repairing exhaust system.** **TASK No. :** **5**		**LOCATION OF TEST** **CANDIDATE'S NAME** **EVALUATOR'S NAMES**
12	**TEST FACTORS AND ITEMS**	**STANDARD MET**	**STANDARD NOT MET (Comments)**
	DID THE CANDIDATE ? 5.1 Dress in appropriate safety clothing. 5.2 Select the appropriate tools and equipment. 5.3 Identify and report condition of damaged parts of exhaust system. 5.4 Remove damaged parts of the exhaust system as specified. 5.5 Replace damaged parts of the exhaust system as specified without damage. 5.6 Check exhaust system for exhaust gas leaks. 5.7 Clean used tools and equipment and return to specified location. 5.8 Complete the job within specified time.		

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TASK SPECIFICATION

5.	**TASK TITLE : Servicing /repairing/testing drum type brakes** **TASK No. :6** **JOB TITLE : Heavy Vehicle Mechanic, L-2**
6.	**TASK ELEMENTS** 6.1 Receives verbal/written instructions. 6.2 Dons protective clothing. 6.3 Selects appropriate hand tools and equipment. 6.4 Jacks up vehicle. 6.5 Removes wheels and brake drums. 6.6 Inspects and reports condition of brake shoes/drums. 6.7 Removes brake shoes. 6.8 Replaces brake linings. 6.9 Refits brake shoes. 6.10 Cleans brake drums. Replaces if necessary. 6.11 Refits brake drums and wheels and tightens wheel nuts preliminarily. 6.12 Adjusts gap between brake drums and brake shoes. 6.13 Jacks down vehicle. 6.14 Tightens wheels nuts. 6.15 Tests brakes. 6.16 Cleans and returns tools and equipment.

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TASK SPECIFICATION

7.	**TASK PERFORMANCE REQUIREMENTS** A vehicle , workshop manual, jack/stands, open ended/ring/socket spanners, screwdrivers (flat and phillips), pliers, hammers, wheel nut spanners, brake adjusting tool, riveting machine, brake shoes, brake linings, emery paper, drill machine, rivets, kerosene, jute, waste rage, cleaning brush, cleaning fluid or alcohol, files, safety goggles, mask, torque wrench.
8.	**TASK PERFORMANCE STANDARDS** Mechanic dressed in appropriate safety clothing. Appropriate hand tools and equipment selected. Vehicle jacked up safely. Wheels/brake drums and brake shoes removed as specified without damage. Faulty/inefficient/damaged components of the brake drum and shoes identified. Brake shoes removed and replaced as specified without damage. Brake shoes refitted as specified without damage. Brake drums made free of rust oil and grease. Drums and wheels refitted as specified. Clearance between brake drums and shoes adjusted as specified. Vehicle downed safely. Wheel nuts tightened as per specified method and torque without damage. Brakes serviced/repaired and adjusted tested for desired performance as per manufacturer's specifications. Used tools and equipment cleaned and returned to specified place.

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9	10	TASK TRAINING DATA			
Task No.	**T.E. No**	**TECHNICAL KNOWLEDGE**	**APPLIED CALCULATIONS**	**GRAPHIC INFORMATION**	**SAFETY and HYGIENE**
6.	**1.**	Knowledge and use of workshop manual, diagram and parts catalogue.		Reading and interpretation of manufacturer's specifications, workshop manual and parts catalogue.	First aid:- practicing and reporting.
	2.	Knowledge of use/types/application/care of hand tools and equipment such as brake adjusting tool, spanners, open ended/ring/socket spanners, screwdriver, pliers, jack/stands etc.			Importance of using safety clothing.
	3.	Knowledge of identification of jacking points and procedure for jacking up vehicle.			Hazards involved in using tools and equipment.
	4.	Knowledge and procedure of removing wheels/brake drums and brake shoes.			Consequence of using improper tools/using tools improperly.
	5.	Knowledge of operation of common brake shoe arrangement and procedure of inspecting and reporting condition of brake shoes and drums.			Hazards involved in jacking vehicle and working under jacked vehicle.
	6.	Knowledge and methods of removing brake shoes/linings.			
	7.	Knowledge of riveting machine.			
	8.	Knowledge and procedure of refitting brake shoes.			
	9.	Knowledge and procedure of refitting brake drums and wheels.			

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9	10	TASK TRAINING DATA			
Task No.	**T.E. No**	**TECHNICAL KNOWLEDGE**	**APPLIED CALCULATIONS**	**GRAPHIC INFORMATION**	**SAFETY and HYGIENE**
6.					
	11.	Knowledge and purpose of gap between brake drums and shoes and procedure of adjusting gap between brake drums and shoes.			
	12.	Knowledge and procedure of jacking down and removing jack/stands.			
	13.	Knowledge and procedure of tightening wheel nuts.			
	14.	Knowledge and procedure of testing brakes.			Hazards involved in running engine.
	15.	Knowledge of braking distance according to road/speed and load condition.			
	16.	Knowledge of cleaning procedure used tools and equipment and returning them to proper place.			

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TASK PERFORMANCE TEST (skill assessment)

11	**TASK TITLE : Servicing/repairing/testing drums type brakes** **TASK No. : 6**	**LOCATION OF TEST** **CANDIDATE'S NAME** **EVALUATOR'S NAMES**

12	TEST FACTORS AND ITEMS	STANDARD MET	STANDARD NOT MET (Comments)
	DID THE CANDIDATE ? 6.1 Dress in appropriate safety clothing. 6.2 Select the appropriate hand tools and equipment. 6.3 Jack up vehicle safely. 6.4 Remove wheels, brake drums and brake shoes as specified without damage. 6.5 Identify faulty/inefficient and damaged brake drum and shoes. 6.6 Remove and replace brake shoes as specified without damage. 6.7 Refits brake shoes as specified without damage. 6.8 Clean brake drums to remove rust oil/grease. Replace brake drum if necessary. 6.9 Refit drums and wheels as specified without damage. 6.10 Tighten wheel nuts preliminarily. 6.11 Adjust clearance between brake drums/shoes as specified. 6 .12 Jack down vehicle safely. 6.13 Tighten wheel nuts as per specified methods and torque without damage. 6.14 Test drum brakes on road and adjust if necessary. 6.15 Clean used tools and equipment and return to specified place. 6.16 Complete the job within specified time.		

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TASK SPECIFICATION

5.	**TASK TITLE : Servicing /repairing/testing mechanical parking brake on gear box/propeller shaft.**
	TASK No. :7 **JOB TITLE : Heavy Vehicle Mechanic, L-2**
6.	**TASK ELEMENTS**

7.1 Receives verbal/written instructions.
7.2 Dons protective clothing.
7.3 Selects appropriate hand tools.
7.4 Checks control cable/pin.
7.5 Checks parking brake lever assembly.
7.6 Checks control cable lever.
7.7 Removes flange yoke.
7.8 Removes wheels and brake drums.
7.9 Removes return spring/adjusting screw/spring.
7.10 Removes brake shoes assembly.
7.11 Checks I-cam.
7.12 Refits/replaces the system components.
7.13 Adjusts parking brake.
7.14 Tests parking brake and readjust if necessary.
7.15 Cleans and returns tools.

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TASK SPECIFICATION

7.	**TASK PERFORMANCE REQUIREMENTS** A vehicle, workshop manual, spare parts catalogue, open ended/ring/socket spanners, screwdrivers, pliers, hammers, spare parts, brake adjusting tool, cleaning brush, kerosene, jute/waste rags.
8.	**TASK PERFORMANCE STANDARDS** Mechanic dressed in appropriate safety clothing. Appropriate hand tools selected. Control cable, parking brake lever assembly, control cable lever checked and condition identified. Flange yoke, brake drums return spring, adjusting screw, spring removed as per instruction without damage. Brake shoes assembly removed as specified without damage. I-cam checked and condition identified. The system components refitted as per instruction without damage. Parking brake adjusted as specified without damage. Parking brake tested according to manufacturer's specifications. Used tools cleaned and returned to specified places.

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9	10	TASK TRAINING DATA			
Task No.	**T.E. No**	**TECHNICAL KNOWLEDGE**	**APPLIED CALCULATIONS**	**GRAPHIC INFORMATION**	**SAFETY and HYGIENE**
7.	**1.**	Knowledge of use of workshop manual, diagram and parts catalogue.		Reading and interpretation of manufacturer's specifications, workshop manual and parts catalogue.	First aid:- practicing and reporting.
	2.	Knowledge of application of protective clothing.			Importance of using safety clothing.
	3.	Knowledge of use and care of hand tools such as open ended/ring/socket spanners, screwdrivers, pliers, hammers, jack/stands.			
	4.	Knowledge of types/application and operation of parking brake and identification of parking brake.			Hazards involved in using tools and equipment.
	5.	Knowledge of checking procedure of control cables pin, parking brake lever assembly, control cable lever.			
	6.	Knowledge of removing procedure of propeller shaft, brake drum, return spring, adjusting screw, springs and brake shoes assembly.			Consequence of using improper tools/using tools improperly.
	7.	Knowledge of refitting/replacing procedure of brake system components.			
	8.	Knowledge of checking I-cam.			
	9.	Knowledge of testing procedure of parking brake.			
	10.	Knowledge of cleaning used tools and returning them to specified location.			

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TASK PERFORMANCE TEST (skill assessment)

11	**TASK TITLE :** **Servicing/repairing/testing mechanical parking brake on gear box/propeller shaft.** **TASK No. :** **7**		**LOCATION OF TEST** **CANDIDATE'S NAME** **EVALUATOR'S NAMES**
12	**TEST FACTORS AND ITEMS**	**STANDARD MET**	**STANDARD NOT MET (Comments)**
	DID THE CANDIDATE ? 7.1 Dress in appropriate safety clothing. 7.2 Select the appropriate hand tools. 7.3 Check the control cable pin, parking brake lever assembly and control cable lever as specified and identify its condition. 7.4 Remove propeller shaft, brake drum, return spring, adjusting screw and springs as specified without damage. 7.5 Remove brake shoes assembly as per instruction without damage. 7.6 Check I-cam as per specified method. 7.7 Refit brake system components as per instruction without damage. 7.8 Adjust parking brake as specified or required without damage. 7.9 Test operation of serviced/repaired and adjusted parking brake according to manufacturer's specifications. 7.10 Clean used tools and return to specified places. 7.11 Complete the job within specified time.		

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TASK SPECIFICATION

5.	**TASK TITLE : Servicing /repairing/testing mechanical parking brake on wheel.** **TASK No. :8** **JOB TITLE : Heavy Vehicle Mechanic, L-2**
6.	**TASK ELEMENTS** 8.1 Receives verbal/written instructions. 8.2 Dons protective clothing. 8.3 Selects appropriate hand tools. 8.4 Checks parking brake lever assembly. 8.5 Checks control cable/pin. 8.6 Checks control cable/moving point. 8.7 Removes cam rod/lever/bush. 8.8 Jacks up vehicle. 8.9 Removes wheels and brake drums/shoes. 8.10 Removes and checks U-cam. 8.11 Refits/replaces the system components. 8.12 Jacks down vehicle safely. 8.13 Adjusts parking brake. 8.14 Tests parking brake and readjusts if necessary. 8.15 Cleans and returns tools.

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TASK SPECIFICATION

7.	**TASK PERFORMANCE REQUIREMENTS** A vehicle, workshop manual, spare parts catalogue, open ended/ring/socket spanners, screwdrivers, pliers, hammers, wheel nut spanner, jack/stands, spare parts, brake adjusting tool, cleaning brush, kerosene, jute/waste rags.
8.	**TASK PERFORMANCE STANDARDS** Mechanic dressed in appropriate safety clothing. Appropriate hand tools selected. Parking brake lever assembly, Control cable/pin, control cable/moving point, cam rod/lever/bush checked and condition identified. Vehicle jacked safely without injury. Wheels, brake drums/shoes removed as specified without damage. U-cam removed/checked and condition identified. The system components refitted as per instruction without damage. Brake adjusted as specified without damage. Vehicle downed safely. Parking brake tested according to manufacturer's specifications. Used tools cleaned and returned to specified places.

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9	10	TASK TRAINING DATA			
Task No.	**T.E. No**	**TECHNICAL KNOWLEDGE**	**APPLIED CALCULATIONS**	**GRAPHIC INFORMATION**	**SAFETY and HYGIENE**
8.	**1.**	Knowledge of use of workshop manual, diagram and parts catalogue.		Reading and interpretation of manufacturer's specifications, workshop manual and parts catalogue.	First aid:- practicing and reporting.
	2.	Knowledge of application of protective clothing.			Importance of using safety clothing
	3.	Knowledge of use and care of hand tools such as open ended/ring/socket spanners, screwdrivers, pliers, hammers, jack/stands, wheel nut spanner etc.			Hazards involved in using tools and equipment.
	4.	Knowledge of checking procedure of parking brake lever assembly, control cables/pin, control cable/moving points, and cam rod/lever/bush.			Consequence of using improper tools/using tools improperly.
	5.	Knowledge of identification of jacking points and jacking procedure.			
	6.	Knowledge of removing procedure of wheels, brake drums/shoes			Hazards involved in jacking vehicle and working under jacked vehicle.
	7.	Knowledge of removing and checking U-cam.			
	8.	Knowledge of refitting/replacing procedure of brake system components.			
	9.	Knowledge of adjusting procedure of parking brake.			
	10.	Knowledge of jacking down procedure and removing procedure of jack/stands			
	11.	Knowledge of testing procedure of park brake.			
	12.	Knowledge of cleaning used tools and returning them to specified location.			

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TASK PERFORMANCE TEST (skill assessment)

11	**TASK TITLE :** **Servicing/repairing/testing mechanical parking brake on wheel.** **TASK No. :** **8**	**LOCATION OF TEST** **CANDIDATE'S NAME** **EVALUATOR'S NAMES**

12	TEST FACTORS AND ITEMS	STANDARD MET	STANDARD NOT MET (Comments)
	DID THE CANDIDATE ? 8.1 Dress in appropriate safety clothing. 8.2 Select the appropriate hand tools. 8.3 Parking brake lever assembly, check the control cable/pin, control cable/moving point, cam rod/lever/bush as specified and identify its condition. 8.4 Jack up vehicle safely without injury. 8.5 Remove wheel, brake drum, brake shoes specified without damage. 8.6 Remove and check U-cam as specified method 8.7 Refit brake system components as per instruction without damage. 8.8 Adjust parking brake as specified or required without damage. 8.9 Jack down vehicle safely without injury. 8.10 Test operation of serviced/repaired and adjusted parking brake according to manufacturer's specifications. 8.11 Clean used tools and return to specified places. 8.12 Complete the job within specified time.		

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TASK SPECIFICATION

5.	**TASK TITLE : Servicing /repairing feed pump** **TASK No. :9** **JOB TITLE : Heavy Vehicle Mechanic, L-2**
6.	**TASK ELEMENTS** 9.1 Receives verbal/written instructions. 9.2 Dons protective clothing. 9.3 Selects appropriate tools. 9.4 Inspects/reports on condition of feed pump. 9.5 Disconnects diesel fuel lines. 9.6 Removes feed pump assembly. 9.7 Dismantles feed pump. 9.8 Replaces feed pump components. 9.9 Assembles feed pump. 9.10 Checks operation of feed pump. 9.11 Fits feed pump assembly. 9.12 Connects diesel fuel lines. 9.13 Bleeds air. 9.14 Checks operation of feed pump. 9.15 Cleans and returns tools.

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TASK SPECIFICATION

7.	**TASK PERFORMANCE REQUIREMENTS** A diesel engine, feed pump, workshop manual, spare parts book, open ended/ring/socket spanners, screwdrivers, pliers, hammers, replacement feed pump components, cleaning brush, kerosene, cotton.
8.	**TASK PERFORMANCE STANDARDS** Mechanic dressed in appropriate safety clothing. Appropriate hand tools selected. Faulty/inefficient /damaged feed pump identified and reported . Diesel fuel lines disconnected from feed pump as specified without damage. Feed pump assembly removed from the injection pump as specified without damage. Feed pump dismantled without damage. Feed pump components replaced as specified without damage. Feed pump assembled without damage. Feed pump operation checked by hand for appropriate operation . Feed pump assembly fitted to engine as specified without damage. Diesel fuel lines connected to feed pump as specified without damage. Fuel lines bleed free of air bubbles as specified. Feed pump operation checked with running engine. Tools cleaned and returned to specified place.

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9	10	TASK TRAINING DATA			
Task No.	**T.E. No**	**TECHNICAL KNOWLEDGE**	**APPLIED CALCULATIONS**	**GRAPHIC INFORMATION**	**SAFETY and HYGIENE**
9.				Reading and interpretation of manufacturer's specifications, workshop manual and parts catalogue.	First aid:- practicing and reporting.
	3.	Knowledge of types, care and use of hand tools such as open ended/ring/socket spanners, screwdrivers, pliers, hammers etc.			Importance of using safety clothing.
	4.	Knowledge of types, application and operation of fuel feed pump . Inspecting and reporting procedure of fuel feed pump condition.			Hazards involved in using tools.
	5.	Knowledge of disconnecting procedure of diesel fuel lines.			Consequence of using improper tools/using tools improperly.
	6.	Knowledge of removing procedure of feed pump.			
	7.	Knowledge of dismantling procedure of feed pump.		Identify the components indicated in pictorial view.	
	8.	Knowledge of replacing procedure of components of feed pump.			
	9.	Knowledge of assembling procedure of feed pump.			
	10.	Knowledge of checking procedure of operation of feed pump by hand.			
	11.	Knowledge of fitting procedure of feed pump assembly to engine			
	12.	Knowledge of connecting procedure of diesel fuel lines to feed pump.			
	13.	Knowledge of bleeding procedure of air from the diesel fuel system.			
	14.	Knowledge of checking procedure of feed pump operation by running engine.			Hazards involved in running engine.
	15.	Knowledge of cleaning and returning tools to the specified location.			

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TASK PERFORMANCE TEST (skill assessment)

11	**TASK TITLE : Servicing/repairing feed pump.** **TASK No. : 9**		**LOCATION OF TEST** **CANDIDATE'S NAME** **EVALUATOR'S NAMES**
12	**TEST FACTORS AND ITEMS**	**STANDARD MET**	**STANDARD NOT MET (Comments)**
	DID THE CANDIDATE ? 9.1 Dress in appropriate safety clothing. 9.2 Select the appropriate hand tools. 9.3 Identify and report condition of faulty/inefficient /damaged feed pump. 9.4 Disconnect diesel fuel lines from feed pump as specified without damage. 9.5 Remove feed pump assembly from the injection pump as specified without damage. 9.6 Dismantle feed pump as specified without damage. 9.7 Replace feed pump components as specified without damage. 9.8 Assembly feed pump without damage. 9.9 Check feed pump operation by hand for appropriate operation. 9.10 Fit feed pump assembly to engine as specified without damage. 9.11 Connect diesel fuel lines to feed pump as specified without damage. 9.12 bleed fuel lines free of air bubbles. 9.13 Check operation of feed pump with running engine. 9.14 Clean and return tools to specified place. 9.15 Complete the job within specified time.		

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TASK SPECIFICATION

5. **TASK TITLE : Replacing leaf springs.**

TASK No. :10 **JOB TITLE : Heavy Vehicle Mechanic, L-2**

6. **TASK ELEMENTS**

10.1 Receives verbal/written instructions.
10.2 Dons protective clothing.
10.3 Selects appropriate tools.
10.4 Jacks up vehicle safely.
10.5 Puts safety stand as recommended.
10.6 Removes shackle bolts.
10.7 Removes leaf springs assembly and dismantles.
10.8 Inspects and reports condition of leaf springs, shackle pin, bush, U-bolt, center bolt etc.
10.9 Identifies defective ones and sends for repairs.
10.10 Refits/replaces leaf springs assembly.
10.11 Tightens shackle bolts center bolt as recommended, greases up, and inspects visually to ensure appropriate condition on load.
10.12 Jacks down vehicle safely.
10.13 Cleans and returns tools.

44

TASK SPECIFICATION

7.	**TASK PERFORMANCE REQUIREMENTS** A vehicle, open ended/ring/socket spanners, screwdrivers, pliers, hammers, safety stand/jacks, drift, grease gun, grease, replacement parts, cleaning brush, kerosene, cotton, jute/waste rags.
8.	**TASK PERFORMANCE STANDARDS** Mechanic dressed in appropriate safety clothing. Appropriate hand tools selected. Vehicle jacked up safely. Safety stand put as recommended. Shackle bolts removed without damaging threads. Leaf springs assembly removed and dismantled safely. Condition of leaf springs, shackle pin, bush, U-bolt, center bolt etc. inspected and reported correctly. Defective ones identified and sent for repairing work. Leaf springs assembly refitted/replaced. Shackle bolt, center bolt, U-bolt tightened as recommended and greased correctly and ensure appropriate condition on load. Vehicle downed safely. Used tools cleaned and returned to specified location.

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9	10	TASK TRAINING DATA			
Task No.	**T.E. No**	**TECHNICAL KNOWLEDGE**	**APPLIED CALCULATIONS**	**GRAPHIC INFORMATION**	**SAFETY and HYGIENE**
10.				Reading and interpretation of manufacturer's specifications, workshop manual and parts catalogue.	First aid:- practicing and reporting. Importance of using safety clothing.
	3.	Knowledge of types, care and use of hand tools such as open ended/ring/socket spanners, screwdrivers, pliers, hammers etc.			Hazards involved in using tools.
	4.	Knowledge of jacks and safe jacking procedure.			Hazards involved in jacking vehicle and working under jacked vehicle.
	5.	Knowledge of removing leaf springs assembly.			
	6.	Knowledge of inspecting and reporting procedure of leaf springs and allied components.			
	7.	Knowledge of fitting/replacing procedure of leaf spring assembly.			
	8.	Knowledge of tightening procedure of shackle bolts/pin/U-bolt.			
	9.	Knowledge of greasing through grease nipples.			
	10.	Knowledge of proper use of grease gun.			
	11.	Knowledge of cleaning and returning tools to the specified location.			

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TASK PERFORMANCE TEST (skill assessment)

11	**TASK TITLE : Replacing leaf springs.** **TASK No. : 10**	**LOCATION OF TEST** **CANDIDATE'S NAME** **EVALUATOR'S NAMES**

12	TEST FACTORS AND ITEMS	STANDARD MET	STANDARD NOT MET (Comments)
	DID THE CANDIDATE ? 10.1 Dress in appropriate safety clothing. 10.2 Select the appropriate hand tools. 10.3 Jack up vehicle safely. 10.4 Put safety stand as recommended. 10.5 Remove shackle bolt without damaging thread. 10.6 Remove leaf springs assembly & dismantle safely. 10.7 Inspect and report condition of leaf springs, shackle pin, bush, U-bolt, center bolt etc. 10.8 Identify defective ones and send for repairs. 10.9 Refit/replace leaf springs assembly correctly. 10.10 Tighten shackle bolt, center bolt and U-bolt as recommended. Grease up and inspect visually for working condition. 10.11 Jack down vehicle safely. 10.12 Clean used tools and return to specified location. 10.13 Complete the job within specified time.		

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TASK SPECIFICATION

5.	**TASK TITLE : Testing shock absorbers.** **TASK No. :11** **JOB TITLE : Heavy Vehicle Mechanic, L-2**
6.	**TASK ELEMENTS** 11.1 Receives verbal/written instructions. 11.2 Dons protective clothing. 11.3 Selects appropriate tools. 11.4 Jacks up vehicle safely, if necessary. 11.5 Removes shock absorbers. 11.6 Inspects and reports condition of shock absorbers. 11.7 Tests shock absorbers. 11.8 Replaces/refits shock absorbers. 11.9 Jacks down vehicle and removes jack/stands, if necessary. 11.10 Cleans and returns tools.

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TASK SPECIFICATION

7.	**TASK PERFORMANCE REQUIREMENTS** A vehicle, workshop manual, jack/stands, open ended/ring/socket spanners, screwdrivers, pliers, pipe wrench, shock absorber, rubber bushes, cleaning brush, kerosene, cotton, jute/waste rags.
8.	**TASK PERFORMANCE STANDARDS** Mechanic dressed in appropriate safety clothing. Appropriate hand tools selected. Vehicle jacked up safely, if necessary. Shock absorbers removed as specified without damage. Damaged/inoperative shock absorbers and rubber bushes identified and reported. Operation of shock absorber tested as per manufacturer's specifications without damage. Shock absorber and rubber bushes replaced/refitted as specified without damage. Vehicle down safely and jack/stands removed, if necessary. Used tools cleaned and returned to specified location.

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TASK TRAINING DATA

9	10				
Task No.	**T.E. No**	**TECHNICAL KNOWLEDGE**	**APPLIED CALCULATIONS**	**GRAPHIC INFORMATION**	**SAFETY and HYGIENE**
11.				Reading and interpretation of manufacturer's specifications, workshop manual and parts catalogue.	First aid:- practicing and reporting.
					Importance of using safety clothing.
	3.	Knowledge of types, care and use of hand tools such as open ended/ring/socket spanners, pliers, pipe wrench etc.			Hazards involved in using tools.
	4.	Knowledge of identification of jacking points and jacking procedure.			
	5.	Knowledge of removing procedure of shock absorbers.			Hazards involved in jacking vehicle and working under jacked vehicle.
	6.	Knowledge of:- a) Identification of types and application of shock absorbers. b) Inspecting and reporting procedure of condition of the shock absorbers and bushes.			
	7.	Knowledge of testing procedure of shock absorbers.			
	8.	Knowledge of replacing/refitting procedure of shock absorbers and rubber bushes.			
	9.	Knowledge of jacking down procedure of vehicle and removing procedure of jack/stands.			
	10.	Knowledge of cleaning procedure of used tools and returning tools to specified location.			

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TASK PERFORMANCE TEST (skill assessment)

	TASK TITLE : Testing shock absorbers.		**LOCATION OF TEST** **CANDIDATE'S NAME**
11	**TASK No. : 11**		**EVALUATOR'S NAMES**
12	**TEST FACTORS AND ITEMS**	**STANDARD MET**	**STANDARD NOT MET (Comments)**
	DID THE CANDIDATE ? 11.1 Dress in appropriate safety clothing. 11.2 Select appropriate hand tools. 11.3 Jack up vehicle safely, if necessary. 11.4 Remove shock absorber as specified without damage. 11.5 Identify and report condition of the shock absorbers and rubber bushes. 11.6 Test shock absorbers operation as per manufacturer's specification without damage. 11.7 Replace/refit shock absorber and rubber bushes as specified without damage. 11.8 Jack down vehicle safely and remove jack/ stands, if necessary. 11.9 Clean used tools and return to specified place. 11.10 Complete the job within specified time.		

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TASK SPECIFICATION

5.	**TASK TITLE : Servicing /repairing steering linkage.** **TASK No. :12** **JOB TITLE : Heavy Vehicle Mechanic, L-2**
6.	**TASK ELEMENTS** 12.1 Receives verbal/written instructions. 12.2 Dons protective clothing. 12.3 Selects hand tools. 12.4 Jacks up vehicle. 12.5 Removes tie-rod end nuts, tie-rod ends, pit-man arm nut, idler arm bolt and steering linkage assembly, bush/bearing and universal joints used with steering wheel shaft. 12.6 Inspects and reports condition of parts. 12.7 Refits idler arm bolt, pit-man arm nut, tie-rod ends, tie-rod end nuts and adjust tie-rod alignment and greases. 12.8 Jacks down vehicle and removes jack/stands. 12.9 Cleans and returns tools.

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TASK SPECIFICATION

7.	**TASK PERFORMANCE REQUIREMENTS** A vehicle, workshop manual, spare parts book, open ended/ring/socket spanners, pliers, screwdrivers, hammers, jack/stands, puller, replacement steering linkage components, grease, grease gun , pipe wrench, toe in and toe out gauge/measuring tape, kerosene, cotton, cleaning brush, jute/waste rags.
8.	**TASK PERFORMANCE STANDARDS** Mechanic dressed in appropriate safety clothing. Appropriate hand tools selected. Vehicle jacked up safely. Tie- rod end nuts/tie- rod ends/pitman arm/nuts/idler arm bolt and steering linkage assembly, bush/bearing and universal joints used with steering wheel shaft removed as specified without damage. Condition of parts identified and reported. Idler arm bolts/pitman arm nut/tie-rod ends and tie rod end nuts, bush/bearing and universal joints used with steering wheel shaft refitted as specified without damage. Tie-rod alignment adjusted and greased up as specified. Vehicle downed safely and jack/stands removed to specified location. Used tools cleaned and returned to specified location.

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9	10	TASK TRAINING DATA			
Task No.	T.E. No	TECHNICAL KNOWLEDGE	APPLIED CALCULATIONS	GRAPHIC INFORMATION	SAFETY and HYGIENE
12.				Reading and interpretation of manufacturer's specifications, workshop manual and parts catalogue.	First aid:- practicing and reporting.
					Importance of using safety clothing.
	3.	Knowledge of care, types and use of hand tools such as open ended/ring/socket spanners, screwdrivers, pliers, hammers, puller etc.			Hazards involved in using tools.
	4.	Knowledge of identification of jacking points and jacking procedure.			
	5.	Knowledge of removing procedure of tie-rod ends nuts, tie - rod ends, pitman arm nut, idler arm bolt and steering linkage assembly.			Hazards involved in jacking vehicle and working under jacked vehicle.
	6.	Knowledge of:- a) Identification of types and application of steering linkage. b) Inspecting and reporting procedure of condition of parts of steering linkage.			
	7.	Knowledge of:- a) Refitting procedure of idler arm bolt, pitman are nut, tie- rod ends, tie- rod end nuts. b) Adjusting procedure of tie rod alignment and lubricating grease nipples.			
	8.	Knowledge of jacking down procedure of vehicle and removing procedure of jack/stands.			
	9.	Knowledge of cleaning procedure of used tools and returning tools to proper place.			

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TASK PERFORMANCE TEST (skill assessment)

	TASK TITLE : **Servicing/repairing steering linkage.**	**LOCATION OF TEST**
		CANDIDATE'S NAME
11	**TASK No. :** **12**	**EVALUATOR'S NAMES**

12	**TEST FACTORS AND ITEMS**	**STANDARD MET**	**STANDARD NOT MET (Comments)**
	DID THE CANDIDATE ? 12.1 Dress in appropriate safety clothing. 12.2 Select appropriate hand tools. 12.3 Jack up vehicle safely. 12.4 Remove tie-rod end nuts, tie-rod ends, pitman arm nuts, idler arm bolt and steering linkage assembly, bush/bearing and universal joints used with steering wheel shaft as specified without damage. 12.5 Identify and report condition of components of the steering linkage. 12.6 Refit idler arm bolt, pitman arm nut, tie-rod ends, and tie- rod end nuts, bush/bearing and universal joints as specified without damage. Adjust tie-rod alignment and lubricate greasing nipples. 12.7 Jack down vehicle safely and remove jack/ stands. 12.8 Clean used tools and return to specified place. 12.9 Complete the job within specified time.		

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TASK SPECIFICATION

5. **TASK TITLE : Servicing /repairing steering box.**

TASK No. :13 **JOB TITLE : Heavy Vehicle Mechanic, L-2**

6. **TASK ELEMENTS**

13.1 Receives verbal/written instructions.
13.2 Dons protective clothing.
13.3 Selects hand tools and equipment.
13.4 Checks steering box lubrication (Visually)
13.5 Removes pitman arm.
13.6 Removes and dismantles steering box.
13.7 Inspects and reports condition of steering box parts.
13.8 Replaces damaged/worn out parts of the steering box.
13.9 Assembles steering box parts.
13.10 Locates high spot in steering box by turning steering from lock to lock.
13.11 Refits steering box in the vehicle.
13.12 Checks and adjusts worm bearing pre-load.
13.13 Checks free play and adjusts steering box by turning wheel.
13.14 Refits pit-man arm.
13.15 Fills steering box with lubricating oil.
13.16 Cleans and returns tools and equipment.

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TASK SPECIFICATION

7.	**TASK PERFORMANCE REQUIREMENTS** A vehicle, workshop manual, spare parts book, open ended/ring/socket spanners, screwdrivers, pliers, puller, spring balance, steering box lubricating oil, grease, spare parts, cleaning brush, kerosene, cotton, jute/waste rags.
8.	**TASK PERFORMANCE STANDARDS** Mechanic dressed in appropriate safety clothing. Appropriate hand tools and equipment selected. Steering box lubrication checked visually, pit-man arm removed. Steering box removed and dismantled as specified without damage. Steering box condition inspected and reported. Damaged/worn out parts of the steering box replaced as per manufacturer's specification. Steering box parts assembled without damage. High spot located in steering box by turning steering from lock to lock. Steering box refitted in the vehicle. Pre-load of bearing worm shaft checked and adjusted as specified. Free play in steering box checked by turning wheel. Pitman arm refitted as per manufacturer's specification without damage. Steering box filled with oil recommended grade of lubricating oil. Used tools and equipment cleaned and returned to specified location.

9	10	TASK TRAINING DATA			
Task No.	**T.E. No**	**TECHNICAL KNOWLEDGE**	**APPLIED CALCULATIONS**	**GRAPHIC INFORMATION**	**SAFETY and HYGIENE**
13.	**3.**	Knowledge of care, types and use of hand tools and equipment, such as open ended/ring/socket spanners, puller, pliers, screwdrivers, spring balance etc.		Reading and interpretation of manufacturer's specifications, workshop manual and parts catalogue.	First aid:- practicing and reporting.
	4.	Knowledge of types and function of steering gear box, lubricating oil and checking procedure of steering gear box lubrication.			Importance of using safety clothing.
	5.	Knowledge of removing procedure of pitman arm.			
	6.	Knowledge of removing and dismantling procedure of steering box.			Hazards involved in using wrong tools and equipment and tools used in appropriatlly.
	7.	Knowledge of inspecting/reporting procedure of steering box parts.			
	8.	Knowledge of replacing procedure of damaged/worn-out parts of the steering box.			
	9.	Knowledge of assembling procedure of steering box parts.			
	10.	Knowledge of locating method of high spot in steering box by turning steering from lock to lock.			
	11.	Knowledge of fitting steering box in the vehicle.			
	12.	Knowledge of checking and adjusting procedure of pre-load of bearing of the worm shaft.			
	13.	Knowledge of checking procedure of free Play in steering box by turning wheel.			
	14.	Knowledge of refitting procedure of pit-man arm.			
	15.	Knowledge of filling procedure of lubricating oil in the steering box.			
	16.	Knowledge of cleaning procedure of used tools and equipment and returning tools and equipment to specified place.			

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TASK PERFORMANCE TEST (skill assessment)

	TASK TITLE : Severing/repairing steering box.	**LOCATION OF TEST** **CANDIDATE'S NAME**
11	**TASK No. : 13**	**EVALUATOR'S NAMES**

12	**TEST FACTORS AND ITEMS**	**STANDARD MET**	**STANDARD NOT MET (Comments)**
	DID THE CANDIDATE ? 13.1 Dress in appropriate safety clothing. 13.2 Select appropriate hand tools and equipment. 13.3 Check steering box lubrication visually. 13.4 Remove pit-man arm. 13.5 Remove and dismantle steering box as specified without damage. 13.6 Inspect and report condition of steering box parts correctly. 13.7 Replace damaged/worn out parts of the steering box parts as per manufacturer's specification with. 13.8 Assemble steering box parts without damage. 13.9 Locate high spot in steering box by turning steering from lock to lock. 13.10 Refit steering box in the vehicle. 13.11 Check and adjust pre-load of worm shaft with spring balance. 13.12 Check free play in steering box by turning wheel. 13.13 Refit pit-man arm as per manufacturer's specifications without damaging components. 13.14 Fill steering box oil as per specified level and grade. 13.15 Clean used tools and equipment and return to specified place. 13.16 Complete the job within specified time.		

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TASK SPECIFICATION

5.	**TASK TITLE : Servicing wheel bearing.** **TASK No. :14** **JOB TITLE : Heavy Vehicle Mechanic, L-2**
6.	**TASK ELEMENTS** 14.1 Receives verbal/written instructions. 14.2 Dons protective clothing. 14.3 Selects hand tools. 14.4 Jacks up vehicle. 14.5 Removes wheel, brake drum, axle shaft. 14.6 Removes lock nut and hub. 14.7 Removes wheel bearing and spacer. 14.8 Cleans and inspects condition of bearing, hub and axle shaft and reports their condition. 14.9 Replaces damaged parts, greases, wheel bearing and assembles. 14.10 Replaces new oil seal. 14.11 Refits hub assembly and axle shaft. 14.12 Checks and adjusts wheel bearing pre-load. 14.13 Refits axle shaft, brake drum and wheel. 14.14 Jacks down vehicle, removes jack/stands. 14.15 Cleans and returns tools.

TASK SPECIFICATION

7.	**TASK PERFORMANCE REQUIREMENTS** A vehicle, workshop manual, spare parts book, open ended/ring/socket spanners, pliers, screwdrivers, soft drift, soft head hammer, jack/stands, wheel bearing puller, wheel nut spanner, spring balance, wheel bearing grease, replacement parts, cleaning brush, cotton, jute/waste rags.
8.	**TASK PERFORMANCE STANDARDS** Mechanic dressed in appropriate safety clothing. Appropriate hand tools selected. Vehicle jacked up safely. Wheel, brake drum, axle shaft removed without damage. Lock nut and hub removed as specified without damage. Wheel bearings and spacer removed and mud/iron particles and foreign materials cleaned from bearings. Bearing, hub, axle shaft, spacer condition identified and reported. Damaged parts replaced and greased as per manufacturer's specification. Wheel bearing assembled without damage. New oil seal replaced. Hub assembly and axle shaft refitted. Wheel bearing pre-load checked and adjusted as per specification. Axle shaft, brake drum and wheel refitted as per manufacturer's specification without damaging its components. Vehicle downed safely and jack/stands removed. Used tools cleaned and returned to specified place.

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9	10	TASK TRAINING DATA			
Task No.	**T.E. No**	**TECHNICAL KNOWLEDGE**	**APPLIED CALCULATIONS**	**GRAPHIC INFORMATION**	**SAFETY and HYGIENE**
14.	**3.**	Knowledge/ care, types and use of hand tools such as open ended /ring socket spanners, pliers, soft drift, soft head hammer, wheel nut spanner, screwdrivers etc.		Reading and interpretation of manufacturer's specifications, workshop manual and parts catalogue.	First aid:- practicing and reporting.
	4.	Knowledge of identification of jacking points and jacking procedure.			Importance of using safety clothing.
	5.	Knowledge of function of wheel, brake drum, axle shaft and removing procedure of above components.			
	6.	Knowledge of function of lock nut, hub, bearing, spacer removing and cleaning procedure of bearing, hub and lock nut..			Hazards involved in jacking vehicle and working under jacked vehicle.
	7.	Knowledge of inspecting and reporting procedure of bearing, hub ands axle shaft condition.			
	8.	Knowledge of replacing procedure of damaged parts, greasing and assembling of service/replace parts.			
	9.	Knowledge of replacing new oil seal.			
	10.	Knowledge of refitting procedure of hub assembly and axle shaft.			
	11.	Knowledge of effects of pre-load on bearing life and checking/adjusting procedure of bearing pre-load.			
	12.	Knowledge of refitting procedure of axle shaft, brake drum and wheel.			
	13.	Knowledge of jacking down procedure of vehicle and removing jack/stands.			
	14.	Knowledge of cleaning used tools and returning to specified place.			

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TASK PERFORMANCE TEST (skill assessment)

	TASK TITLE : Severing wheel bearings.	**LOCATION OF TEST** **CANDIDATE'S NAME**
11	**TASK No. : 14**	**EVALUATOR'S NAMES**

12	**TEST FACTORS AND ITEMS**	**STANDARD MET**	**STANDARD NOT MET (Comments)**
	DID THE CANDIDATE ? 14.1 Dress in appropriate safety clothing. 14.2 Select appropriate hand tools. 14.3 Jack up vehicle safely. 14.4 Remove wheel, brake drum and axle shaft as per manufacturer's specification manual without damaging components. 14.5 Remove lock nut, hub bearing, spacer and clean mud/iron particles and foreign materials from bearing, spacer, hub and axle shaft. 14.6 Identify and report condition of bearing, hub and axle shaft. 14.7 Replace damaged parts as per manufacturer's specification, grease, wheel bearing, spacer and assemble without damage. 14.8 Replace new oil seal. 14.9 Refit hub assembly and axle shaft without damage. 14.10 Check and adjust wheel bearing pre-load with spring balance. 14.11 Refit axle shaft, brake drum and wheel. Tighten wheel nuts preliminarily and adjust brakes. 14.12 Jack down vehicle safely and remove jack/stands to specified place. 14.13 Tighten wheel nuts as per specified method and torque. 14.14 Clean used tools and return to specified place. 14.15 Complete the job within specified time.		

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