GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
DIRECTORATE GENERAL OF TRAINING

COMPETENCY BASED CURRICULUM

DRIVER CUM MECHANIC (LMV)

(Duration: Six Months)

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL- 2


SECTOR –AUTOMOTIVE

Directorate General of Training

DRIVER CUM MECHANIC (LMV)

(Non-Engineering Trade)

(Revised in March 2023)

Version: 2.0

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL - 2

Developed By

Ministry of Skill Development and Entrepreneurship

Directorate General of Training

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1. COURSE INFORMATION

During the Six Months duration a candidate of 'Driver cum Mechanic (LMV)' trade is trained on Professional Skill, Professional Knowledge and Employability Skill related to job role. In addition to this a candidate is entrusted to make/do project work and Extra Curricular Activities to build up confidence. The broad components covered under Professional Skill & Professional Knowledge subjects are as below:

After completion of this course the trainee will be able to drive Light Motor Vehicle drive safely on the assigned route without Company of a senior driver and will ensure Road worthiness of the vehicle through pre-operational checks also the trainee will drive in conformance to standard driving practices and follow Traffic Regulations and maintenance of good road conduct. Apart from driving the vehicle the trainee will also be able to carry out the Basic Servicing of vehicle, carry out checks of steering and suspension system for its road worthiness, Basic Servicing of front and rear wheels, brake, check ignition circuit for proper functioning.

Also, the trainee will be able to Communicate with required clarity and understand technical English, environmental issues, self-learning and productivity.

2. TRAINING SYSTEM

2.1 GENERAL

The Directorate General of Training (DGT) under Ministry of Skill Development & Entrepreneurship offers a range of vocational training courses catering to the need of different sectors of economy/ Labour market. The vocational training programmes are delivered under the aegis of Directorate General of Training (DGT). Craftsman Training Scheme (CTS) with variants and Apprenticeship Training Scheme (ATS) are two pioneer schemes of DGT for strengthening vocational training.

Driver cum Mechanic (LMV) trade under CTS is one of the popular courses delivered nationwide through a network of ITIs. The course is of six months duration. It mainly consists of Domain area and Core area. The Domain area (Trade Theory & Practical) imparts professional skills, and Professional knowledge, while Core area (Employability Skills) imparts requisite core skills and life skills. After passing out of the training programme, the trainee is awarded National Trade Certificate (NTC) by DGT which is recognized worldwide.

Candidates need broadly to demonstrate that they are able to:

- Read & interpret technical parameters/documentation, plan work, identify necessary materials and tools;
- Perform task with due consideration to safety rules, accident prevention regulations and environmental protection stipulations;
- Apply professional knowledge, core skills & employability skills while performing the job.
- Check the job/assembly as per drawing for functioning, identify and rectify errors in job/assembly.
- Document the technical parameters related to the task undertaken.

2.2 PROGRESSION PATHWAYS:

- Can join industry as Driver cum Mechanic and will progress further as Senior Driver/Technician, Supervisor and can rise up to the level of Manager.
- Can become Entrepreneur in the related field.
- Can join Apprenticeship programme in different types of industries leading to National Apprenticeship certificate (NAC).
- Can join Crafts Instructor Training Scheme (CITS) in the trade for becoming instructor in ITIs.

2.3 COURSE STRUCTURE:

Table below depicts the distribution of training hours across various course elements during a period of six months: -

S No.	Course Element	Notional Training Hours
		Six Months
1	Professional Skill (Trade Practical)	420
2	Professional Knowledge (Trade Theory)	120
3	Employability Skills	60
	Total	**600**

2.4 ASSESSMENT& CERTIFICATION

The trainee will be tested for his skill, knowledge and attitude during the period of course through formative assessment and at the end of the training programme through summative assessment as notified by the DGT from time to time.

a) The **Continuous Assessment (Internal)** during the period of training will be done by **Formative assessment method** by testing for assessment criteria listed against learning outcomes. The training institute have to maintain individual *trainee portfolio* as detailed in assessment guideline. The marks of internal assessment will be as per the formative assessment template provided on www.bharatskills.gov.in.

b) The final assessment will be in the form of summative assessment method. The All India Trade Test for awarding NTC will be conducted by Controller of examinations, DGT as per the guidelines. The pattern and marking structure is being notified by DGT from time to time. **The learning outcome and assessment criteria will be basis for setting question papers for final assessment. The examiner during final examination will also check** individual trainee's profile as detailed in assessment guideline before giving marks for practical examination.

2.4.1 PASS REGULATION

For the purposes of determining the overall result, weightage of 100% is applied for six months and one year duration courses and 50% weightage is applied to each examination for two years courses. The minimum pass percent for Trade Practical and Formative assessment is 60% & for all other subjects is 33%.

2.4.2 ASSESSMENT GUIDELINE

Appropriate arrangements should be made to ensure that there will be no artificial barriers to assessment. The nature of special needs should be taken into account while undertaking the assessment. Due consideration should be given while assessing for teamwork, avoidance/reduction of scrap/wastage and disposal of scrap/waste as per procedure, behavioral attitude, sensitivity to the environment and regularity in training. The sensitivity towards OSHE and self-learning attitude are to be considered while assessing competency.

Assessment will be evidence based comprising some of the following:

- Job carried out in labs/workshop
- Record book/ daily diary
- Answer sheet of assessment
- Viva-voce
- Progress chart
- Attendance and punctuality
- Assignment
- Project work
- Computer based multiple choice question examination
- Practical Examination

Evidences and records of internal (Formative) assessments are to be preserved until forthcoming examination for audit and verification by examining body. The following marking pattern to be adopted for formative assessment:

Performance Level	Evidence
(a) Marks in the range of 60%-75% to be allotted during assessment	
For performance in this grade, the candidate should produce work which demonstrates attainment of an acceptable standard of craftsmanship with occasional guidance, and due regard for safety procedures and practices	• Demonstration of good skills and accuracy in the field of work/ assignments. • A fairly good level of neatness and consistency to accomplish job activities. • Occasional support in completing the task/ job.
(b) Marksin the range of 75%-90% to be allotted during assessment	
For this grade, a candidate should produce work which demonstrates attainment of a reasonable standard of craftsmanship, with little guidance, and regard for safety procedures and practices	• Good skill levels and accuracy in the field of work/ assignments. • A good level of neatness and consistency to accomplish job activities. • Little support in completing the task/job.

(c) Marksin the range of more than 90% to be allotted during assessment	
For performance in this grade, the candidate, with minimal or no support in organization and execution and with due regard for safety procedures and practices, has produced work which demonstrates attainment of a high standard of craftsmanship.	• High skill levels and accuracy in the field of work/ assignments. • A high level of neatness and consistency to accomplish job activities. Minimal or no support in completing the task/ job.

3. JOB ROLE

Driver Cum Mechanic (LMV); To drive Light Motor Vehicle safely & efficiently on public & private roads, following all Rule and regulations in force & giving no room for accidents that causing damage to other road users, public & private properties, passengers and goods being carried. Strictly maintaining scheduled times for passengers embarking/disembarking & goods loading /unloading. To collect passenger or goods as per information received from office. Maintain politeness with passengers and follow all the safety/security measures. Calculate appropriate fares communicating/collecting the same from passengers. Calculate the freight costs-based goods weight & volumes and the distance and communicate / collect from the consigner. Proper discharge of passenger or goods at the appropriate place as per instruction and time schedules. Communicate & handover the passenger fare / freight amounts with relevant information to office / owner. Always keep statutory documents / records pertaining to self, the vehicle, passengers & goods & to present when demanded by the concerned authorities. Understand & follow the regulation while transporting the Hazardous goods. To know about the vehicle & various system available and use them judiciously. Maintain the vehicle in good working condition, doing pre-checks before starting the vehicle. Plan & carry out timely recommended services by manufacturers. Maintain operating vehicle economically by achieving good KMPL & better tyre life.

To maintain good relationship with other crew members and be courteous with other road users. Maintain physical & mental fitness all the times though stress releasing methods.

Reference NCO-2015:

i. 8322.0501 - Light Motor Vehicle Driver

Reference NOS: --

i. ASC/N9414
ii. ASC/N9704

4. GENERAL INFORMATION

Name of the Trade	**DRIVER CUM MECHANIC (LMV)**
Trade Code	DGT/1032
NCO - 2015	8322.0501
NOS Covered	ASC/N9414, ASC/N9704
NSQF Level	Level – 2
Duration of Craftsmen Training	Six Months (600 Hours)
Entry Qualification	Passed 8th Class Examination
Minimum Age	18 years as on first day of academic session.
Eligibility for PwD	LD, LC, DW, AA
Unit Strength (No. Of Student)	20 (There is no separate provision of supernumerary seats)
Space Norms	56 sq. m
Power Norms	6.82 KW
Instructors Qualification for	
1. Driver cum Mechanic (LMV) Trade	B.Voc./Degree in Mechanical/ Automobile Engineering from AICTE/UGC recognized Engineering College/ university with one-year experience in the relevant field with LMV Driving license. **OR** 3 yearsDiploma in Mechanical/ Automobile Engineering from AICTE/ recognized Engineering College/ university or relevant Advanced Diploma (Vocational) from DGT with one-year experience in the relevant fieldwith LMV Driving license. **OR** NTC/ NAC passed in the Trade of "Driver Cum Mechanic (Light Motor Vehicle)" with 3 Years experience in the relevant field with LMV Driving license. **<u>Essential Qualification</u>:** Relevant Regular / RPL variants of National Craft Instructor Certificate (NCIC) under DGT. ***Note: Out of two Instructors required for the unit of 2(1+1), one must have Degree/Diploma and other must have NTC/NAC qualifications. However, both of them must possess NCIC in any of its variants.***
2. Employability Skill	MBA/ BBA / Any Graduate/ Diploma in any discipline with Two years'

	experience with short term ToT Course in Employability Skills. (Must have studied English/ Communication Skills and Basic Computer at 12th / Diploma level and above) **OR** Existing Social Studies Instructors in ITIs with training in Employability skills.
3. Minimum age for Instructor	21 years
List of Tools and Equipment	As per Annexure – I

5. LEARNINGOUTCOME

Learning outcomes are a reflection of total competencies of a trainee and assessment will be carried out as per the assessment criteria.

5.1LEARNING OUTCOMES

1. Comply with environment regulations and housekeeping in the workshop (5S / Kaizen) following safety precautions. (NOS: ASC/N9414)
2. Identify Vehicle Components. (NOS: ASC/N9704)
3. Drive in conformance to standard driving practices. (NOS: ASC/N9704)
4. Ensure road worthiness of the vehicle through pre-operational checks, checks in-between journey and end of the Journey. (NOS: ASC/N9704)
5. Drive vehicle following Traffic Regulations maintaining good road conduct. (NOS: ASC/N9704)
6. Perform Daily Maintenance/Daily Inspection on Vehicle. (NOS: ASC/N9704)
7. Carry out checks of Vehicle aggregates. (NOS: ASC/N9704)
8. Check ignition circuit for proper functioning. (NOS: ASC/N9704)
9. Check wheel alignment and Perform Wheel Rotation. (NOS: ASC/N9704)
10. Carry out the general servicing of vehicle components. (NOS: ASC/N9704)

6. ASSESSMENT CRITERIA

LEARNING OUTCOMES	ASSESSMENT CRITERIA
1. Comply with environment regulations and housekeeping in the workshop (5S / Kaizen) following safety precautions. (NOS: ASC/N9414)	Identify environmental pollution and contribute to the avoidance of instances of environmental pollution.
	Carryout maintenance and cleaning of work shop and lifting equipment environmentally friendly manner.
	Avoid waste and dispose waste as per procedure the working environment.
	Recognize different components of 5S and apply the same in the working environment.
2. Identify Vehicle Components. (NOS: ASC/N9704)	Comply with safety rules when performing the following operations.
	Locate and identify the various components in a vehicle.
3. Drive in conformance to standard driving practices. (NOS: ASC/N9704)	Conform to standard driving practices.
	Conform to traffic regulations.
4. Ensure road worthiness of the vehicle through pre-operational checks, checks in-between journey and end of the Journey. (NOS: ASC/N9704)	Check for vehicle meets Legal, organizational, CMVR/RTA, other safety, Security & Environmental guidelines.
	Check vehicle service record indicative of any history of defects or immediate service needs.
	Record deviations observed.
	Record any other deviations observed during the trip.
	Report actual or possible defects on vehicle clearly for diagnosis/rectifications by technical staff.
	Consult with superiors conclude about roadworthiness of the vehicle & if found unfit to decide on using another vehicle.
5. Drive vehicle following Traffic Regulations maintaining good road conduct. (NOS: ASC/N9704)	Maintain good road conduct.
	Maintain defensive driving practices.
	Apply best driving practices to maintain fuel economy.
	Maintain road discipline & extend courtesy to other road users.
6. Perform Daily Maintenance/Daily Inspection on Vehicle.	Follow and maintain procedure to achieve a safe working environment in line with general servicing of two & three wheeler.

(NOS: ASC/N9704)	Identify & locate the parts of two & three wheeler.
	Comply with safety rules when performing the operation.
	Select tools, equipment's and material required for servicing of vehicle.
	Wash the vehicle with washer with appropriate pressure required for each parts.
	Change and maintain the oil level as required.
	Lubricate the components which are necessary.
7. Carry out checks of Vehicle aggregates. (NOS: ASC/N9704)	Select tools, equipment's, measuring instruments and material required for servicing of overhauling head assembly.
	Comply with safety rules when performing the operation.
	Plan, organize work and Comply with safety rules when performing job.
	Identify the parts of steering and suspension system.
	Check shock absorber for proper functioning and replace if necessary.
	Remove front and rear wheel, dismantle and check for truing, alignment.
	Inspect the brake drum, Brake shoe for worn out and replace if necessary.
	Check tire for wear and tube for puncture.
	Check and inflate tire for correct pressure as per specification.
	Check wheel bearing and grease it. (Understand specific grease requirement).
	Check and adjust front and rear brake lever free play as per manual.
8. Check ignition circuit for proper functioning. (NOS: ASC/N9704)	Ascertain and select tools and materials for the job.
	Comply with safety rules when performing the following operations.
	Plan and select different methods for charging the battery.
	Perform battery testing as per the operating procedure.
	Identify the parts of ignition circuits.
	Check ignition system components for proper functioning.
	Inspect and adjust ignition timing.
	Set and check emission as per standard.
9. Check wheel alignment and Perform Wheel	Select tools, equipment's, measuring instruments and material required for servicing of overhauling head assembly.

Rotation. (NOS: ASC/N9704)	Comply with safety rules when performing the operation.
	Carryout Wheel Rotation.
10. Carry out the general servicing of vehicle components. (NOS: ASC/N9704)	Select tools, equipment's, and material required for the job.
	Plan, organize work and Comply with safety rules when performing job.
	Identify the parts of vehicle to be service and maintain.
	Carry out servicing and maintenance of vehicle as per mfg.'s schedule.

SYLLABUS FOR DRIVER CUM MECHANIC (LMV) TRADE			
DURATION: SIX MONTHS			
Duration	**Reference Learning Outcome**	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
Professional Skill 29Hrs; Professional Knowledge 07 Hrs	Comply with environment regulations and housekeeping in the workshop (5S / Kaizen) following safety precautions.	1. Importance of trade training, List of tools & Machinery used in the trade. 2. Health, Safety and Environment guidelines, legislations & regulations as applicable. Disposal procedure of waste materials like cotton waste, metal chips/burrs etc. Basic safety introduction. 3. Basic injury prevention, Basic first aid, Hazard identification and avoidance, safety signs for Danger, Warning, caution & personal safety message. 4. Preventive measures for electrical accidents & steps to be taken in such accidents. 5. Practice Use of Fire extinguishers. 6. Arrange to obtain Lerner license from concern RTO.	Importance of safety and general precautions observed in the in the industry/shop floor. All necessary guidance to be provided to the new comers to become familiar with the working of Industrial Training Institute system including stores procedures. **Soft Skills: its importance and Job area after completion of training.** Introduction of First aid. Operation of electrical mains. Introduction of PPEs. Introduction to 5S concept & its application. Response to emergencies e.g.; power failure, fire, and system failure. **DRIVING THEORY:** Qualities required for a good driver: Good behaviour, Patience, Responsibility, Self Confidence, Anticipation, Concentration, Courtesy, Consideration for other Road Users, Defensive Driving, Knowledge of Road Rules and Regulations, Knowledge of Vehicle Controls, Maintenance, simple mechanism and effect of Competitiveness, Over-

			Confidence, impatience. Driving Regulations: Road Rule Regulations made under sec 118 of Motor Vehicle Act 1988, Hand Signals of a driver, Traffic & Road Signs, Hand signals of traffic constable and traffic wardens, Introduction to Automatic Light Signals, Introduction to Road markings, Speed regulation on city road and highways.
Professional Skill 20Hrs; Professional Knowledge 07 Hrs	Identify Vehicle Components.	7. Perform Preliminary checking / identification of various vehicle parts / aggregates. 8. Identify various gauges & Tell-tale Lamps in the instrument panel & interpretation of readings. 9. Perform Identification & use of different types electrical switches.	Simple introduction to Automobile Engines and their working. Location of VIN plate / Engine serial Number. Vehicle Controls and its Response: Foot Control – Accelerator, Brake, Clutch Hand Control – Steering Wheel, Gear Shifting Lever, Hand Brake, Switches for direction Indicators, Head Lights, Horns, Ignition Switch, Dim-Bright Switch, and Wiper switch – Speed Control etc. Other Controls – Rear View mirrors – Types- adjustments, Instrument Cluster, Description of Speedo meter/Trip meter, RPM Gauge, Oil pressure Gauge, Temp Gauge, Fuel Gauge, and Ammeter other Gauges and Dials, Tell-tale lamps, Audio warnings, Wind Screen – their purpose & Working. Adjustment of seat and knowledge on seat belts, door locks. Fuse carrier location, Fuse layout.

			Knowledge on Latest Information systems: On Board Diagnosis system. Intelligent transport system. Air Bags, Audio warning systems Automated Manual Transmission, Dual power mode (Power or Economy Mode).
Professional Skill 20Hrs; Professional Knowledge 07 Hrs	Drive in conformance to standard driving practices.	10. Practice in Simulator. 11. Practice Initial freeway Driving.	Introduction to Driving Simulator
Professional Skill 29Hrs; Professional Knowledge 07 Hrs	Ensure road worthiness of the vehicle through pre-operational checks, checks in-between journey and end of the Journey.	12. Perform Pre – Driving Checks: Before sitting on driver seat, After sitting on driver seat. 13. Checking the document pertains to the driver and vehicle. 14. Perform Adjustment of seat, Rear View mirrors and wearing seat belt. 15. Carryout Vehicle Starting Practice. 16. Check the leaks of tyres in between the journey. 17. Ensure Main Switch off, windows, doors are closed, apply wheel chokes and complete paper work.	Pre – Driving Checks: - Before sitting on driver seat, Leakage of Fuel, Oil, water, Air, Battery etc - After sitting on driver seat, Guages etc. - Checking the document pertains to the driver and vehicle. Starting: Precautions and Procedure to be followed while starting. Clutch down start Accelerator: Proper use of Accelerator. Moving: Precautions to be followed while moving. Use of first gear.
Professional Skill 132Hrs; Professional Knowledge 36Hrs	Drive in conformance to standard driving practices.	18. Perform Clutch Practice: Biting and Balance point. 19. Perform Steering practice: In basic yard - In bare land and between tyres to develop Judgment Straight, Left and Right Turn, Steering in ‘8’ shaped bend.	Use of Clutch: Correct Leg position on the Clutch pedal Biting Point, Balance Point. Steering - Holding Steering Wheel: - Push and pull method - On the move - While gear changing

			- While turning - While sounding Horn - While operating dash board switches - While Signaling - On emergency
		20. Perform Gear Practice: Practice Selection of gears, up shifting, down shifting. 21. Brake practice: In level ground and in Slope and Braking and Stopping Practice.	Gear Shifting - Up shifting, Down Shifting – Procedures. Use of Over Drive Gear. Gear shift pattern on different vehicles. Pressure point shifting method in synchromesh & AMT Vehicle. Stopping: Normal stopping, Emergency stopping, use of Engine Brake. Stopping distance= Reaction Distance +Braking Distance.
		22. Practice Driving on the Road. 23. Perform Overtaking Practice: 24. Practice Overtaking stationary and Moving vehicles from Left and Right Side.	Driving on the Road: Anticipation, Judgment, Positioning the Vehicle according to other Road users. Use of IPDE(Identification, Prediction, Decision, Execution) principles while Driving MSPSL(Mirror Signal Maneuver) – Routine Use of Indicators. Defensive Driving Techniques: Judgment, Anticipation, Escape route. Priority for certain Vehicles: Emergency Vehicles, Fire Engines and Ambulance. Overtaking: Overtaking stationary vehicle, Moving vehicle in Left and right side – IPDE principle. Traffic Education MV Act Section 118.

		25. Practice 3 Point Turn, 5 Point Turn, 'U' Turn. 26. Practice on following distance.	Other Maneuvers: Merging, Diverging, turning to left and Right, 3-point Turn, 5 point turn, Passing, Crossing, Cornering. Following Distance: Meaning, Distance Method, Car length Method, 2 seconds time rule method, Distance between cars while driving at Railway crossing.
		27. Perform Reverse Practice: Straight, Left, right and Reverse practice in'8' shaped bend. 28. Perform Parking Practice: Angular Parking, Perpendicular parking, Parallel Parking – Forward Entry and Reverse Entry. Parking facing Uphill and Parking facing downhill.	Reversing: Locating Reverse gear, Confidence, Speed control, Steering Control, Weaving in '8' shaped Bend. Parking: Parallel, Angular, Perpendicular, Parking facing uphill, Parking facing downhill.
		29. Practice Night Driving. 30. Practice Driving According to Lanes: Single, Two, Four and Six lane Roads. 31. Practice Village Road Driving & Perform Highway Driving. 32. Practice Driving in Crowded Street. 33. Perform Cross country Driving.	Night Driving: Location of Head light switch, Use of Head light, Use of Dipper at night- Procedure. Lane Selection and lane Discipline: Single, double, 4 and 6 lanes Village and Highway Driving: Procedures and precautions. Driving under Special Condition: In wet weather, In dawn, dusk and misty road, In dense traffic, Cross country driving - Knowledge on Ground Clearance.
		34. Practice Hill Driving: Driving uphill, driving downhill, Driving in Hairpin bend. 4	Hill Driving: Starting in hill using parking brake method and slipping the

		WD Drive Practice. 35. Perform Vehicle Towing Practice.	clutch method – Procedures. Selection of gear – uphill and downhill – procedures. Towing a disabled Vehicle: Procedures, Precautions, Limitations under road rule regulations 1989, Identification of Towing Eye. Speed limit, 'ON Tow' board.
		36. Practice on stopping the vehicle using Handbrake. 37. Perform Simulator Driving Practice: With Simulation of extreme conditions.	Emergency Manoeuvres: Skidding, Horn Stuck, Fire, Wheels Coming out, Brake failure, Broken Stub axle, burst of front tyre, Sudden steering wobbling, snapping of steering linkage, Jamming of accelerator pedal, Snapping of clutch linkage, under special circumstances of collision with disabled vehicle. Brake failure during downhill, sudden obstruction in front of vehicle etc. – Prevention is better than cure.
Professional Skill 20Hrs; Professional Knowledge 07 Hrs	Drive vehicle following Traffic Regulations maintaining good road conduct.	38. Practice Driving on Various road as per Road Rule Regulation 1989. 39. Practice Demo on Hand Signals of a Driver. 40. Perform Driving test at concern RTO(6)	**TRAFFIC EDUCATION:** Motor Vehicle Act, Important definitions and salient features of motor vehicle Act. Vehicle registration and insurance of motor vehicle. Learner's license and its particulars, Driving License particulars and its renewal. Knowledge about log book and different Forms and papers related to vehicles. Vehicle fitness certificate, Permit and Tax and production of documents on demand by checking officers. Knowledge on seating Capacity and load limit. Knowledge on loading and load distribution on

			vehicle while loading of goods. Know your Road: Functional classification, Design Speed, Road Geometrics, Surface types and characteristics, Slopes and Elevation. Sight Distance: At bends, At intersections Road Junctions: Principles and Types, T junction, Y junction, 4-Arm junction, Staggered Junction, Controlled Junction, Uncontrolled Junction. Traffic Islands: Types of roundabouts, channelisers, Median Bye-Pass, Subway, Over-bridge and flyovers: Purpose, precautions and procedures Driving according to other Road Users Characteristics: Pedestrians, drunkards, Children, blind, deaf, dump, youth, aged, women with children, Slow-moving vehicles, Mopeds, Motor cycles, Autos, Tempos, Vans, Buses, Trucks, VIP, Ambulance, Fire Engine and Animals etc.. Accidents: Types, Causes, Preventive methods, Drivers duties and responsibilities on the occurrence of accidents. Symbols on the vehicle which is carrying Hazardous goods: Panel Board, Class Labels. Important provision of motor vehicle Act section 122, 125, 126, 128, 131, 132, 133, 134, 135, 136 & 139. Legal awareness. Traffic offences and penalties

			stipulated under the act and rules. Driving Test: Sub rule 3 of Rule 15 of Central Motor Vehicle Rules 1989.
Professional Skill 20 Hrs; Professional Knowledge 07 Hrs	Perform Daily Maintenance/Daily Inspection on Vehicle.	**ENGINE BASICS:** 41. Identification of different types of vehicle and engine components. 42. Familiarization of operator manual. Check / replenish / top up – lubricating oil, engine coolant, power steering hydraulic oil, wind screen wiper water, battery electrolyte and transmission oil. 43. Replace – air cleaner, oil filter & fuel filter. 44. Apply Grease to parts / through greasing points (if necessary).	**VEHICLE MECHANISM:** Nomenclature of different parts of vehicle and their locations. Classification of vehicle & load carrying capacities. Pattern of loading various goods. E C & I C Engine – Types, engine terminologies, parts description & functions. Types of fuels used in vehicle. Working principle of 4 stroke SI & CI engines. Differences between 2 strokes & 4 strokes engine, petrol & diesel engines. Concept of MPFI, CRDI, Turbo Chargers, EDC Fuel supply layouts in diesel engines, Injection systems. Brief introduction on injectors. Lubrication system, types of filters & lubricants. Types of Greases & greasing points. Recommended vehicle maintenance schedules.
Professional Skill 46Hrs; Professional Knowledge 14Hrs	Carry out checks of Vehicle aggregates.	**TRANSMISSION SYSTEM:** 45. Check / replenish / transmission oil. 46. Check breathers and Clutch Pedal Play. **BRAKE SYSTEM** 47. Check and top up Brake fluid in the Reservoir. 48. Perform Brake Bleeding. 49. Perform Adjustment of brake paddle play.	Layout of power flow from Engine to wheels. Purpose of clutch, Types of Clutch, Knowledge on Clutch play, Types of gear box- Gear Shifting procedures General defects in clutch, manual gearbox Knowledge on Automatic transmission and Automated Manual Transmission. Propeller Shafts, & Knowledge on differential. Knowledge on 2and4

			wheel drive. Types of Brake systems – working principle of drum and disc brakes General defects in brake systems. Tandum Master Cylinder Procedure to be followed in case of brake failure. Antilock Brake System
		STEERING SYSTEM 50. Check level of power steering oil in the reservoir. **SUSPENSION SYSTEM** 51. Grease the points in suspension system.	Types of steering System and its working, Power assisted steering, Steering linkages. Types of suspension system, Greasing points Effect of tampering the suspension system. Brief on suspension and its effects on steering.
Professional Skill 29Hrs; Professional Knowledge 07 Hrs	Check ignition circuit for proper functioning.	**BATTERY AND IGNITION SYSTEM:** 52. Remove and refit of Fuses, head lamp, Signal lamps, Parking lamp bulbs. 53. Check and adjust Head Lamp High Beam, Low Beam, Pass by beam. 54. Check Combination switches, Directional indicators, Wiper-Intermittent operation, low & high speed operations. 55. Perform Cleaning and topping up of a lead acid battery. 56. Remove and refit lead acid battery. 57. Carry out checks on Alternator unit, Battery and Power units.	Ignition system circuit & components. Actions to be taken when Ignition key lost. Spare/Duplicate key information & location. Definition of Fuses & need for fuses in electrical circuits. Brief introduction on ignition Description of chemical effect, Batteries and cells, lead acid batteries & stay maintenance free (SMF) batteries. Fuse Ratings.
Professional Skill 29Hrs;	Check wheel alignment and Perform Wheel	**TYRE REPAIR/INSPECTION:** 58. Practice Removal & re-fitting of wheel from vehicle.	Types of wheels, designation, construction. Types of tyres& tubes (solid &

Professional Knowledge 07 Hrs	Rotation.	59. Perform Measurement of tread wear. 60. Carryout Inflating the tyres with compressed Air /Nitrogen from Tyre inflator. 61. Repair a Puncture Tyre using Tubeless puncture Repair kit. 62. Practice on Tyre rotation as per vehicle manufacturers recommendation.	pneumonic tyre – Cross ply & Radial ply, desirable properties component & function, designation, tyre ratings for temperature & traction. Maintenance of tyre& tubes. Reasons for defects of tyre. Tread patterns & their applications. Inspection procedure. Tyre pressure monitoring system. Procedure for retreading the Tyre. Procedure for tyre rotation for Different make of vehicle. Tubeless Tyres. Thread wear Indicator. DOT (Manufacturing Date code) Importance of Two wheel & four wheel alignment. Reasons for Alignment problems – steering pull, off-center steering, steering shimmy, excessive steering effort, poor self-centering and memory steer, bump steer, torque steer & steering harshness-alignment diagnostics chart & steering problem diagnostic chart. Meaning of balance, causes & effects of imbalance, vibration. Identification of source, transfer path & responder of vibration(can be felt & can be heard) Steering wheel shake – shimmy, wobble & waddle Brief on static balance, dynamic balance, Mounting errors (radial & lateral) & excessive (Tyre & rim) run out-lateral & radial and mismatches.

Professional Skill 46Hrs; Professional Knowledge 14 Hrs	Carry out the general servicing of vehicle components.	**Maintenance of Vehicle Systems:** 63. Perform Air bleeding in diesel vehicle. 64. Check and replacing wiper blades. 65. Checking coolant reservoir tank. 66. Practice Cleaning air cleaner. 67. Perform Cleaning of cooling motor. 68. Carryout Emission testing. 69. Check the Air conditioner and heater unit. **JACKS & HAND TOOL KITS:** 70. Practice on using different type of vehicle jacks. 71. Practice on using vehicle hand tool kit.	Cooling system & types of Anti-freeze /Anti rust solutions use. Air intake and Exhaust System Knowledge about CNG & LPG Gas kit. Cooling and lubrication system. Air Intake System. Exhaust system, Different types of fuel. Fuel Properties, Stoichiometric Ratio. Introduction to HVAC system. Specification, types and uses of different kinds of vehicle jacks. Description, care and maintenance of Mechanical & Hydraulic jacks. Description, care and maintenance of vehicle tools in kit. Identification of Jacking Points. Basics of computer, Email operation system. Fluency in reading and writing Writing of Reports Mathematical calculations on loads/freight/fares/KMPL. Management of personal expenses. Need to Cultivate habit of Savings for future needs. Knowledge on various general and personal Insurance Knowledge on Various saving schemes available with nationalized bank.
Revision & Examination			

SYLLABUS FOR CORE SKILLS
1. Employability Skills (Common for all CTS trades) (60Hrs)

Learning outcomes, assessment criteria, syllabus and Tool List of Core Skills subjects which is common for a group of trades, provided separately inwww.bharatskills.gov.in/ dgt.gov.in

ANNEXURE-I

LIST OF TOOLS AND EQUIPMENT			
DRIVER CUM MECHANIC (LMV)(For batch of 20 Candidates)			
SNo.	**Name of the Tool &Equipment**	**Specification**	**Quantity**
A. TRAINEES TOOL KIT (For each additional unit trainees tool kit Sl. 1-18 is required additionally)			
1.	Hammer ball Peen	0.75 Kg.	21 Nos.
2.	Chisel Cold Flat	19 mm.	21 Nos.
3.	Centre Punch	10 mm. Dia x 100 mm.	21 Nos.
4.	Steel Rule 15 cm English and Metric		21 Nos.
5.	Screw Driver	30 cm x 9 mm. Blade	21 Nos.
6.	Screw Driver	20 cm x 9 mm. Blade	21 Nos.
7.	Spanner DE Set of 12 pieces	6 mm - 32 mm	21 Nos.
8.	Plier Combination	15 cm	21 Nos.
9.	Hand File 20 cm second cut		21 Nos.
10.	Feeler gauge 20 blades (Metric)		21 Nos.
11.	Ring spanner set of 12 pieces	6 mm - 32 mm	21 Nos.
12.	Steel tool box with Lock and Key (folding type)	size 400 x 200 x 150 mm.	21 Nos.
13.	Allen Key set of 12 pieces	2 mm.-14 mm	5 sets
14.	Circlip Plier (Ext. and Int.)	150 mm. and 200 (two each)	10 sets
15.	Philips screw driver type set of 5 pieces 100 mm.	300 mm.	5 sets
16.	Socket spanner (1 set of 12 nos.)	6mm to 32mm	5 sets
17.	Jack light & heavy type		1 each
18.	Wheel wrench single & cross bar		1 each
B. GENERAL SHOPOUTFITS			
TOOLS AND EQUIPMENTS			
19.	Light Motor Vehicle	With double clutch and double brake pedal	1 No.
20.	Driving Simulator		1 No
21.	Light Motor Vehicle	Running condition	1 No.
22.	Traffic Signal Board		1 No.
23.	Fire Extinguisher	Arrange all proper NOCs and equipment from Municipal/Competent authorities.	

24.	Safety Cones		10 No.
25.	Battery charger	12v to 36v, 10 AMPs	1 no.
26.	Oil Can	500 ml	2 nos.
27.	Adjustable spanner	10” and 12”	2 nos. each
28.	Grease gun	1.5 kg capacity	1 no.
29.	Safety stand		1 no.
30.	Desktop computer and related MS office software	CPU: 32/64 Bit i3/i5/i7 or latest processor, Speed: 3 GHz or Higher. RAM: -4 GB DDR-III or Higher, Wi-Fi Enabled. Network Card: Integrated Gigabit Ethernet, with USB Mouse, USB Keyboard and Monitor (Min. 17 Inch. Licensed Operating System and Antivirus compatible with trade related software.	1 No.
31.	Laser printer		1 No.
32.	Oil syringe	500 ml	1 No.
33.	Multi plug Drain Spanner		1 No.
34.	Tyre Lever		1 No.
35.	Valve Die		10 No.
36.	Driving Track asper Govt. Norms		
C. WORKSHOP FURNITURE			
37.	Discussion Table		1 No.
38.	Tool Cabinet		2 Nos.
39.	Trainees locker		Required to accommodate 20 lockers
40.	Book shelf (glass panel)		1 No.
41.	Storage Rack		3 Nos.
42.	Storage shelf		3 Nos.
43.	Computer table		1 No.
44.	Computer chair		2 Nos.
45.	Online UPS		As required

Note:

1. *All the tools and equipment are to be procured as per BIS specification.*

ANNEXURE – II

The DGT sincerely acknowledges contributions of the Industries, State Directorates, Trade Experts, Domain Experts, trainers of ITIs, NSTIs, faculties from universities and all others who contributed in revising the curriculum.

Special acknowledgement is extended by DGT to the following expert members who had contributed immensely in this curriculum.

List of Expert members participated/ contributed for finalizing the course curriculum of Driver cum Mechanic (LMV) trade held on 20.02.18 at Advanced Training Institute - Chennai			
S No.	**Name & Designation Shri/Mr./Ms.**	**Organization**	**Remarks**
1.	P. Thangapazham, AGM-HR, Training	Daimler India Commercial Vehicles Pvt. Ltd., Chennai	Chairman
2.	A. Duraichamy, ATO/ MMV	DET- Chennai, Govt. ITI, Salem	Member
3.	W. Nirmal Kumar Israel, TO	Gov. ITI, Manikandam, Trichy	Member
4.	S. Venkata Krishna, Dy. Manager	Maruti Suzuki India Ltd., Chennai	Member
5.	S. Karthikeyan, Regional Training Manager	MAruti Suzuki India Ltd., Tamilnadu	Member
6.	N. Balasubramaniam	ASDC	Member
7.	P. Murugesan,	TVS TS Ltd., Ambattur, Chennai	Member
8.	R. Jayaprakash	Ashok Leyland Driver Training Institute, Namakkal	Member
9.	Mr. Veerasany, GM, E. Sakthivel	Maruti Suzuki India Ltd.	Member
10.	M. Madasaniy, Principal	Ramco ITI, Rajapalayam, Tamil Nadu	Member
11.	Sankar S., TO	ATI-Chennai	Member
12.	K. Thaniyaraju, Principal I/C	Gov. ITI, Virali Malai, DET-Chennai	Member
13.	S. Mathivanan, Jt. Director	ATI, Chennai	Member
14.	R. Rajesh Kanna, T.O	ATI, Guindi, Chennai	Member
15.	Dinesh Babu K.K., Chief Instructor	Carriage & Wagon Works, Southern Railway	Member
16.	Suresh Awaji, Manager- Service Training	Ashok Leyland Ltd, Chennai	Member
17.	N. Ramesh Kumar, TO	ATI, Chennai	Member
18.	R. Senthil Kumar, Director	ATI/MSDE/CTI, Chennai	Member
19.	C. Yuvraj	ATI- Chennai	Member
20.	Balajirao. S, Body shop In charge	CUU romotors, 15/16, Thiruvika Industrial Estate, Guindy, Chennai	Member
21.	Nirmalya Nath, Asst. Director	CSTARI, Kolkata	Coordinator/ Member
22.	Akhilesh Pandey, Training Officer	CSTARI, Kolkata	Coordinator/ Member

ABBREVIATIONS

CTS	Craftsmen Training Scheme
ATS	Apprenticeship Training Scheme
CITS	Craft Instructor Training Scheme
DGT	Directorate General of Training
MSDE	Ministry of Skill Development and Entrepreneurship
NTC	National Trade Certificate
NAC	National Apprenticeship Certificate
NCIC	National Craft Instructor Certificate
LD	Locomotor Disability
CP	Cerebral Palsy
MD	Multiple Disabilities
LV	Low Vision
HH	Hard of Hearing
ID	Intellectual Disabilities
LC	Leprosy Cured
SLD	Specific Learning Disabilities
DW	Dwarfism
MI	Mental Illness
AA	Acid Attack
PwD	Person with disabilities


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