



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

COMPETENCY BASED CURRICULUM

MECHANIC DIESEL

(Duration: One Year)

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL- 4



SECTOR – AUTOMOTIVE

7. LEARNING OUTCOME WITH ASSESSMENT CRITERIA

GENERIC LEARNING/ ASSESSABLE OUTCOME	
LEARNING/ ASSESSABLE OUTCOME	ASSESSMENT CRITERIA
1. Recognize & comply with safe working practices, environment regulation and housekeeping.	1. 1. Follow and maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements.
	1. 2. Recognize and report all unsafe situations according to site policy.
	1. 3. Identify and take necessary precautions on fire and safety hazards and report according to site policy and procedures.
	1. 4. Identify, handle and store/ dispose of dangerous/unsalvageable goods and substances according to site policy and procedures following safety regulations and requirements.
	1. 5. Identify and observe site policies and procedures with regard to illness or accident.
	1. 6. Identify safety alarms accurately.
	1. 7. Report supervisor/ Competent of authority in the event of accident or sickness of any staff and record accident details correctly according to site accident/injury procedures.
	1. 8. Identify and observe site evacuation procedures according to site policy.
	1. 9. Identify Personal Protective Equipment (PPE) and use the same as per related working environment.
	1. 10. Identify basic first aid and use them under different circumstances.
	1. 11. Identify different fire extinguisher and use the same as per requirement.
	1. 12. Identify environmental pollution & contribute to avoidance of same.
	1. 13. Take opportunities to use energy and materials in an environmentally friendly manner.
	1. 14. Avoid waste and dispose waste as per procedure.
	1. 15. Recognize different components of 5S and apply the same in the working environment.
2. Understand and explain	2.1 Explain concept of basic science related to the field such as

<p>different mathematical calculation & science in the field of study including basic electrical. <i>[Different mathematical calculation & science - Work, Power & Energy, Algebra, Geometry, Mensuration, Trigonometry, Heat & Temperature, elasticity]</i></p>	Material science, Mass, weight, density, heat & temperature, heat treatment.
	2.2 Measure dimensions as per drawing
	2.3 Use scale/ tapes to measure for fitting to specification.
	2.4 Comply with given tolerance.
	2.5 Prepare list of appropriate materials by interpreting detail drawings and determine quantities of such materials.
	2.6 Ensure dimensional accuracy of assembly by using different instruments/gauges.
	2.7 Explain basic electricity, insulation and earthing.
<p>3. Interpret specifications, different engineering drawing and apply for different application in the field of work. <i>[Different engineering drawing-Geometrical construction, Dimensioning, Layout, Method of representation, Symbol, Different Projections, Assembly drawing, Sectional views, Estimation of material]</i></p>	3. 1. Read and interpret the information on drawings and apply in executing practical work.
	3. 2. Read & analyse the specification to ascertain the material requirement, tools, and assembly/maintenance parameters.
	3. 3. Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/ parameters to carry out the work.
<p>4. Select and measure dimension of components and record data.</p>	4.1 Select appropriate measuring scale/tape/gauges.
	4.2 Measure dimension of the components/assembly & compare with given drawing/measurement.
<p>5. Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day-to-</p>	5.1 Explain the concept of productivity and quality tools and apply during execution of job.
	5.2 Understand the basic concept of labour welfare legislation and adhere to responsibilities and remain sensitive towards such laws.

day work to improve productivity & quality.	5.3 Knows benefits guaranteed under various acts.
6. Explain energy conservation, global warming and pollution and contribute in day-to-day work by optimally using available resources.	6.1 Explain the concept of energy conservation, global warming, pollution and utilize the available recourses optimally & remain sensitive to avoid environment pollution.
	6.2 Dispose waste following standard procedure.
7. Explain personnel finance, entrepreneurship and manage/organize related task in day-to-day work for personal & societal growth.	7. 1. Explain personnel finance and entrepreneurship.
	7. 2. Explain role of various schemes and institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non-financing support agencies to familiarize with the Policies/Programmes & procedure & the available scheme.
	7. 3. Prepare Project report to become an entrepreneur for submission to financial institutions.
8. Plan and execute the work related to the occupation.	8. 1. Use documents, drawings and recognize hazards in the work site.
	8. 2. Plan workplace/ assembly location with due consideration to operational stipulation.
	8. 3. Communicate effectively with others and plan project tasks.
	8. 4. Execute the task effectively.

कौशल भारत - कुशल भारत

SPECIFIC LEARNING/ ASSESSABLE OUTCOMES	
SEMESTER-I	
LEARNING/ ASSESSABLE OUTCOMES	ASSESSMENT CRITERIA
9. Check & perform Measuring & marking by using various Measuring & Marking tools (Vernier Caliper, Micrometer, Telescope gauges, Dial bore gauges, Dial indicators, straightedge, feeler gauge, thread pitch gauge, vacuum gauge, tire pressure gauge.)	9.1 Plan the working principles of measuring instruments and special tools required for auto workshop.
	9.2 Select, care and use of measuring instrument.
	9.3 Set up the measured value with workshop manual and quality concepts and proper safety.
	9.4 Carry out decision on whether to replace or not.
10. Plan & perform basic fastening & fitting operation by using correct hand tools, Machine tools & equipments.	10.1 Describe the purpose, use of auto hand tools.
	10.2 List the safety rules for hand tools.
	10.3 Select the correct tool for the job.
	10.4 Set up the tacked pieces in specific position.
	10.5 Joint components by Brazing, Soldering, Riveting as per given drawing.
	10.6 Produce components by different operation (Drilling, Reaming, Taping, Dieting)
11. Trace and Test all Electrical & Electronic components & circuits and assemble circuit to ensure functionality of system. Charge and test batteries used in vehicle.	11.1 Plan and prepare as per procedure and safety methods of soldering the cable ends using an electric soldering iron.
	11.2 Use crimping tool to make a circuit joint.
	11.3 Explain the connection of an ammeter, voltmeter, and ohmmeter in a circuit trouble shooting.
	11.4 State open & short circuit, series and parallel circuits.
	11.5 Verify DC series & parallel circuits and its characteristics.
	11.6 Check out the open and short circuits in the lighting circuits.
	11.7 Verify ohm's law and measure resistance using rheostat.
	11.8 Check the voltage drop in the auto electrical system by using multimeter.
	11.9 Trace the auto electrical components by using vehicle wiring circuits.
	11.10 Check the condition of the solenoid switch in the starting

	system.
	11.11 Determine the forward to reverse resistance ratio of diodes and identify good / bad diodes.
	11.12 Perform battery charging and check
12. Join components by using Arc & Gas welding.	12.1. Determine the principles, process of different welding process applicable in automobile industry.
	12.2. Demonstrate the edge preparation for butt and fillets welds.
	12.3. Select the type and size of filler rod and flux/electrode, size of nozzle and gas pressure/welding current, preheating method and temperature as per requirement.
	12.4. Set and tack metals as per drawing.
	12.5. Deposit the weld maintaining appropriate technique and safety aspects.
	12.6. Cool the welded joint by observing appropriate cooling method. Use post heating, peening etc. as per requirement.
	12.7. Clean the joint and inspect the weld for its uniformity and different types of surface defects.
13. Trace & Test Hydraulic and Pneumatic components.	13. 1 Demonstrate Brake System (Hydraulic & Air).
	13. 2 Demonstrate Hydraulic Power Steering.
14. Check & Interpret Vehicle Specification data and VIN. Select & operate various Service Station Equipments	14. 1 Identify of different type of vehicle.
	14. 2 Identify the different vehicle specification data and information
	14. 3 Demonstrate the garage, service station different equipment
SEMESTER-II	
15. Dismantle & assemble of Diesel Engine from vehicle (LMV/HMV) along with other accessories. Vehicle performance Test	15. 1 Demonstrate safe handling of lifting equipments.
	15. 2 Identify the problems in the vehicle
	15. 3 Perform the periodic testing of lifting equipments.
	15. 4 Judge whether this Engine needs overhaul or not
	15. 5 Perform dispose the used engine oil and safety measures in disposal.
	15. 6 Perform on vehicle Engine Tests to analyze need of Overall

	15. 7 Perform sequencing and identifying parts at the time of dismantle and assemble.
	15. 8 Then Dismantle of Engine & Overhaul is ok, refer below attached screen shot for your reference
16. Overhaul & service Diesel Engine, its parts and check functionality.(Judge weather this Engine needs overhaul or not)	16.1 Remove accessories fitted to the engine prior to engine removal.
	16.2 Align the left hook of the crane with engine lifting bracket.
	16.3 Remove the engine mountings
	16.4 Remove the engine from vehicle.
	16.5 Mount the engine on the vehicle.
	16.6 Align and fit the gear box to the engine.
	16.7 Refit the accessories to the engine.
	16.8 Set the Timing of the Engine
	16.9 Overhaul Valve Actuating Mechanism (Hydraulic latch actuator).
17. Trace, Test & Repair Cooling and Lubrication System of engine	17.1 Overhauling of Radiator/ Recovery tank water pump, oil pump, air cleaner
	17.2 Check the engine oil pressure at different r.p.ms.
	17.3 Overhaul the Oil Pump.
	17.4 Set Checking &Top up coolant, Draining & refilling coolant.
	17.5 Testing cooling system pressure & Thermostat
	17.6 Cleaning & reverse flushing. Overhauling water pump and refitting and repairs to oil flow pipe lines and unions if necessary.
	17.7 Check proper functioning of radiator fan (Mechanical/ Electrical / viscous / belt drive).
18. Trace & Test Intake and Exhaust system of engine	18. 1 Overhauling of manifolds, silencer and tail pipe, air compressor, air exhauster and inspect parts of air exhauster, turbo charger from vehicle.
	18. 2 Overhauling of air filter, clean & refit air cooler, fuel filter assembly and replace filter elements
	18. 3 Remove and replace EGR valve, Use Smoke meter to test emission from engine.

19. Service Diesel Fuel System and check proper functionality.	19. 1 Overhauling fuel feed pump, fuel injector pump.
	19. 2 Test injectors, check the injection timing by the spill cut off method
20. Plan & overhaul the stationary engine and Governor and check functionality	20. 1 Start engine, adjust idling speed.
	20. 2 Overhaul the Governor (Mechanical & Pneumatic)
	20. 3 Set the Engine Timing.
	20. 4 Check performance of engine off load.
	20. 5 Servicing of the cylinder and replace the defective parts.
21. Monitor emission of vehicle and execute different operation to obtain optimum pollution as per emission norms.	21. 1 Check vacuum pump for its functioning.
	21. 2 Perform troubleshooting of EVAP Canister.
	21. 3 Inspect PCV hose, inspect PCV Valve and check for vacuum.
	21. 4 Clean the PCV valve and replace if required.
	21. 5 Inspect & clean EGR.
22. Carryout overhauling of Alternator and Starter Motor.	22. 1 Trace the circuit from the alternator to the battery.
	22. 2 Perform servicing of starter motor.
	22. 3 Perform servicing of alternator and test its performance.
	22. 4 Check belt condition and replace as per requirement.
23. Diagnose & rectify the defects in LMV/HMV to ensure functionality of vehicle.	23. 1 Plan and diagnose the problem if engine not starting.
	23. 2 Diagnose high fuel consumption and engine overheating.
	23. 3 Diagnose for excessive oil consumption and low/high engine oil pressure.
	23. 4 Diagnose for abnormal engine noise.
	23. 5 Diagnose for engine's poor performance.