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

COMPETENCY BASED CURRICULUM

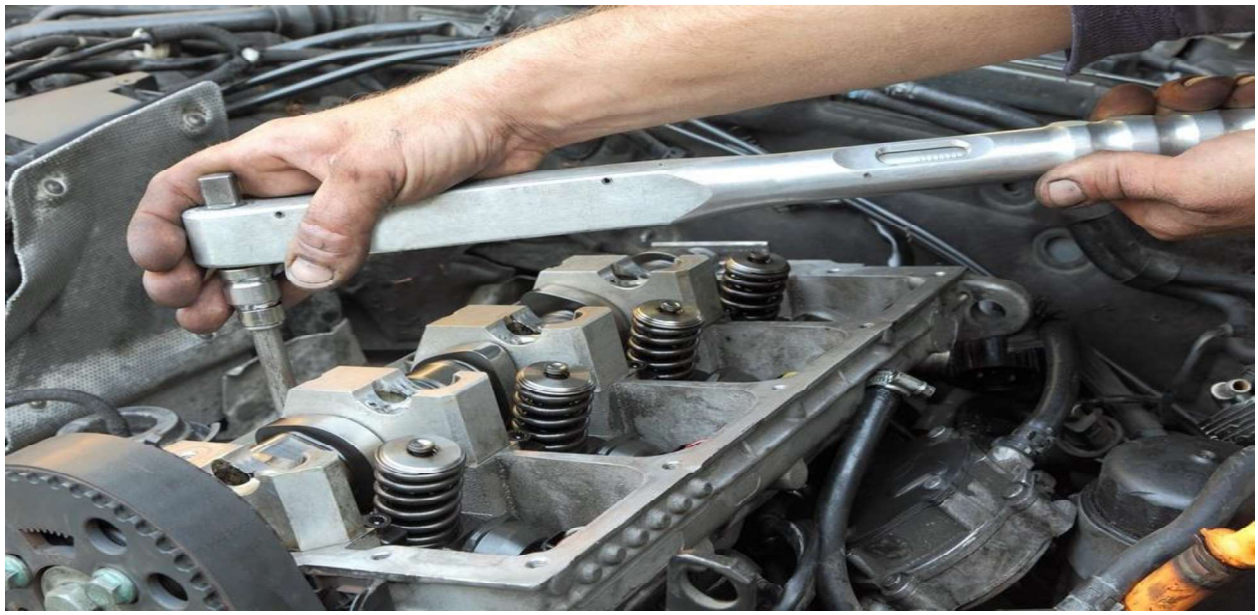
MECHANIC DIESEL

(Duration: One Year)

Revised in July 2022

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL- 3



SECTOR –AUTOMOTIVE

Directorate General of Training

MECHANIC DIESEL

(Engineering Trade)

(Revised in July 2022)

Version: 2.0

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL - 3

Developed By

Ministry of Skill Development and Entrepreneurship

Directorate General of Training

CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE

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7. TRADE SYLLABUS

SYLLABUS FOR MECHANIC DIESELTRADE			
Duration: One Year			
Duration	**Reference Learning Outcome**	**Professional Skills (Trade Practical) With Indicative Hours**	**Professional Knowledge (Trade Theory)**
ProfessionalSkill142 Hrs; ProfessionalKnowledge34 Hrs	Check&performMeasuring & marking byusing various Measuring& Marking tools (VernierCalipers,Micrometer,Telescopegauges,Dialboregauges,Dialindicators, straightedge,feelergauge,threadpitchgauge,vacuumgauge, tirepressuregauge.) Following safety precautions. (Mapped NOS: ASC/N9401)	1. Demonstration ofMachinery used in thetrade.(05hrs) 2. IdentifysafetyGear/PPE(Personal ProtectiveEquipments) and their uses(10 hrs) 3. Importance of maintenanceof safety equipment used inWorkshop.(05hrs) 4. Demonstrationonsafehandlingand Periodictesting of lifting equipment,and Safety disposal of used engine oil. (10 hrs.) 5. Demonstrationonhealthhazards, occupational safety &first Aid. (05 hrs) 6. Demonstrationfireservicestation to provide demo onFiresafety.(05hrs) 7. Perform use of fire extinguishers. (05 hrs) 8. Perform marking using all marking aids, like steel rule with spring callipers, dividers,	- Importance&scopeofMechanicDieselTradeTraining. - General discipline in theInstitute - ElementaryFirstAid,OccupationalSafety&Health - KnowledgeofPersonalSafety&Safetyprecautionsinhandling Dieselmachine - ConceptaboutHouseKeeping&5Smethod. - SafetydisposalofUsedengineoil, - Electricalsafetytips. - SafehandlingofFuelSpillage, - Safedisposalof toxic dust, safehandlingandPeriodictestingofliftingequipment. (10 hrs) **Hand&Power Tools: -** - Marking scheme, marking**material** chalk,Prussianblue. - Cleaningtools-Scraper,wirebrush,Emery paper**,** - Description, care and use ofSurfaceplates,steelrule, measuring tape, try square.Callipers-inside

		scriber, punches, chisel etc. on MS Flat/Sheet Metal. (17 hrs) Measure a wheel base of a vehicle with measuring tape. (08 hrs) 9. Perform to remove wheel lug nuts with use of an air impact wrench (08 hrs) 10. Operate General workshop tools & power tools. (15 hrs)	and outside.Dividers,surfacegauges,scriber, - Punches-prick punch,centrepunch,pinpunch,hollow punch, number andletterpunch.Chisel-flat,cross-cut.Hammer-ballpein,lump,mallet.Screwdrivers-blade - Screwdriver,Phillipsscrewdriver, Ratchet screwdriver.Allenkey, bench vice & C-clamps, - Spanners-ringspanner,openendspanner&thecombination spanner,universaladjustableopenendspanner.Sockets&accessories, - Pliers - Combination pliers,multi grip, long nose, flat-nose,Nippersorpincerpliers,Sidecutters,Tinsnips,Circlippliers,externalcirclipspliers. - Air impactwrench, air ratchet,wrenches-Torquewrenches,pipewrenches, Pipe flaring & cutting tool,pullers-Gearandbearing.(15 hrs)
		11. Perform measuring practice on Cam height, Camshaft Journal dia, crankshaft	**Systemsofmeasurement**, - Description,LeastCountcalculation, care & use of - Micrometers-

		journal dia, Valve stem dia, piston diameter, and piston pin dia with outside Micrometres. (05 hrs) 12. Perform measuring practice on cylinder bore for taper and out-of-round with Dial bore gauges. (10 hrs) 13. Perform measuring practice to measure wear on crankshaft end play, crankshaft run out, and valve guide with dial indicator and magnetic stand (05 hrs) 14. Perform measuring practice to check the flatness of the cylinder head is warped or twisted with straightedge is used with a feeler gauge. (10 hrs) 15. Perform measuring practice to check the end gap of a piston ring, piston-to-cylinder wall clearance with feeler gauge. (09 hrs) 16. Perform practice to check engine manifold vacuum with vacuum gauge. (05hrs) 17. Perform practice to	Outside,anddepthmicrometer, - Micrometeradjustments, - Description,LeastCountcalculation,care&useofVernier Calliper. - Telescope gauges, Dial boregauges,Dialindicators,straightedge,feelergauge,thread pitch gauge, vacuumgauge, tire pressure gauge.(09 hrs)

		check the air pressure inside the vehicle tyre is maintained at the recommended setting. (05hrs)	
ProfessionalSkill90 Hrs; ProfessionalKnowledge; 17 Hrs	Plan&performbasicfastening&fittingoperationbyusingcorrecthandtools, Machine tools & equipments. (Mapped NOS: CSC/N0304)	18. Perform removal of stud/bolt using stud extractor (05hrs) 19. Perform practice on cutting tools like Hacksaw, file, chisel, Sharpening of Chisels, center punch, safety precautions while grinding. (10hrs) 20. Perform practice on Hacksawing and filing to given dimensions. (25 hrs)	- Differenttypesofmetaljoint (Permanent,Temporary), methodsof, Soldering,etc. **Fasteners** - Study of different types ofscrews, nuts, studs & bolts,locking devices, Such as locknuts, cotter, split pins, keys,circlips,lockrings,lockwashers and locating whereetheyareused.Washers&chemical compounds can beusedtohelpsecurethesefasteners.Functionof**Gaskets,**Selectionofmaterialsforgasketsandpacking,**oilseals.Typesof Gaskets** – paper, multilayered metallic,liquid,rubber,copperandprinted. - ThreadSealants-Varioustypeslike,locking, sealing,temperatureresistance,antilocking,lubricatingetc. **Cuttingtools** - StudyofdifferenttypeofcuttingtoolslikeHacksaw,Fil

			e-Definition,partsofafile,specification,Grade,shape, different type of cutanduses.,OFF-handgrinding with sander, benchandpedestalgrinders,safetyprecautionswhilegrinding. (7 Hrs)
		21. Perform practice on Marking and Drilling clear and Blind Holes, Sharpening of Twist Drills Safety precautions to be observed while using a drilling machine. (10hrs) 22. Perform practice on Tapping a Clear and Blind Hole, Selection of tape drill Size, use of Lubrication, Use of stud extractor. (15 hrs) 23. Perform practice cutting Threads on a Bolt/ Stud. Adjustment of two piece Die, Reaming a hole/ Bush to suit the given pin/ shaft, scraping a given machined surface. (25hrs)	**Drillingmachine** - DescriptionandstudyofBenchtypeDrillingmachine, Portable electricalDrillingmachine, drillholdingdevices,Work Holdingdevices,Drillbits. **TapsandDies** - HandTapsandwrenches,Calculation of Tap drill sizesformetricandinchtaps.DifferenttypeofDieand Diestock.Screwextractors. - **HandReamers** DifferentTypeofhandreamers,Drillsizeforreaming, Lapping,Lappingabrasives,typeofLaps.(10 hrs)
ProfessionalSkill92Hrs; ProfessionalKnowledge;	TraceandTestallElectrical&Electroniccomponents&circuits and assemble	24. Perform practice in joining wires using soldering Iron. (20 hrs) 25. Prepare simple	**Basicelectricity** - Electricity principles, - Ground connections, - Ohm's law,

14 Hrs	circuit toensurefunctionalityofsystem. (Mapped NOS: ELE/N9412)	electrical circuits, measuring of current, voltage and resistance using digital multimeter. (20 hrs) 26. Perform practice continuity test for fuses, relay and diodes (09hrs)	- Voltage, Current, Resistance, Power, Energy. - Voltmeter, ammeter, Ohmmeter, Multimeter, - Conductors & insulators, Wires, Shielding, Length vs. resistance,Resistorratings (04Hrs)
		27. Check circuit using of service manual wiring diagram fortroubleshooting (08 hrs)	- Fuses& circuit breakers, - Ballast resistor, - Stripping wire insulation, - Cable colour codesand sizes, Resistors in Series circuits, - Parallel circuits and Series- parallel circuits (04Hrs)
		28. Execute cleaning and topping up of a lead acid battery. (10 hrs) 29. Perform testing battery with hydrometer. (12 hrs) 30. Perform connecting battery to a charger for battery charging and checking & testing a battery after charging. (08 hrs) 31. Perform test of relay and solenoids and its circuit. (05 Hrs)	- Description of Chemical effects, Batteries & cells, Lead acid batteries & Stay Maintenance Free (SMF) batteries, - Magnetic effects, Heating effects, Thermo-electric energy, Thermistors, Thermo couples, - Electrochemical energy, Photo-voltaic energy, Piezo- electric energy, Electromagnetic induction, - Relays, Solenoids, Primary & Secondary windings, Transformers, stator and rotor coils. (6

			Hrs)
ProfessionalSkill35 Hrs; ProfessionalKnowledge;9 Hrs	Trace&TestHydraulicand Pneumaticcomponents. (Mapped NOS: CSC/N0304)	32. Identify of Hydraulic and pneumatic components used in vehicle. (10 hrs) 33. Tracing of hydraulic circuit on hydraulic jack, hydraulic, and Brake circuit. (15hrs) 34. Identify components in Air brake systems (10hrs)	**Introduction to Hydraulics &Pneumatics** - Description,symbols and application in automobile of Gear pump-Internal & External, single acting, double acting & Double ended cylinder; Directional control, Pressure relief valve, Non return valve, Flow controlvalveused inautomobile. (9 hrs)
ProfessionalSkill25Hrs; ProfessionalKnowledge; 5 Hrs	Check&InterpretVehicleSpecificationdataandVIN.Select&operatevariousServiceStationEquipments. (Mapped NOS: CSC/N9404)	35. IdentifyofdifferenttypesofVehicle.(05 hrs) 36. Demonstrateofvehicle specificationdata. (05hrs) 37. Identifyofvehicleinformation Number (VIN).(05 hrs). 38. DemonstrateofGarage, Service stationequipments.-Vehiclehoists-Twopostandfourposthoist,Enginehoists,Jacks,Stands.(10hrs)	- Classification of vehicles onthebasisofloadaspercentralmotorvehiclerule,wheels, final drive, and fuelused,axles,positionofengineandsteeringtransmission,bodyandload.Brief description - UsesofVehiclehoists–Twopostandfourposthoist,Engine hoists, Jacks, Stands. (05 Hrs)
ProfessionalSkill50Hrs; ProfessionalKnowledge; 8 Hrs	Dismantle&assembleofDieselEnginefromvehicle(LMV/HMV)alongwithotheraccessories. (Mapped NOS: ASC/N9402)	39. IdentifythedifferentpartsofICEngine(10hrs) 40. Identifythedifferentparts in a diesel engine ofLMV/ HMV (10 hrs) 41. Performpracticeonstartingandstoppingofdieselengines.Observeand	**IntroductiontoEngine**: - Description of internal & external combustion engines, Classification of IC engines, Principle &working of 2 & 4-stroke diesel engine (Compression ignition

		report the reading ofTachometer,Odometer,tempandFuelgauge underidealandonloadcondition.(10hrs) 42. Practiceondismantling DieselengineofLMV/HMVasperprocedure.(20hrs)	Engine (C.I), - Principle of Spark Ignition Engine(SI), differentiate between 2-stroke and 4 stroke, C.I engine and S.I Engine, - Main Parts of IC Engine - Direct injection and indirect injection, Technical terms used in engine, Engine specification. - Study of various gauges/ instrument on a dash board of a vehicle- Speedometer, Tachometer, Odometer and Fuel gauge, and Indicators such as gearshift position, Seat belt warning light, Parking-brake-engagement warning light and an Engine-malfunction light. - Different type of starting and stopping method of Diesel Engine - Procedure for dismantling of diesel engine from a vehicle. (8 hrs)
ProfessionalSkill;160Hrs; Professional Knowledge; 25Hrs	Overhaul&serviceDieselEngine,itspartsandcheckfunctionality. (Mapped NOS: ASC/N9403)	43. PerformOverhaulingofcylinderheadassembly, Useofservicemanualfor 44. clearance and other parameters.	**DieselEngineComponents:** - Description and Constructional feature of Cylinder head, Importance of Cylinder head design,

		(10hrs) 45. Performpracticeonremovingrockerarmassemblymanifolds.(05hrs) 46. Performpracticeonremovingthevalvesanditsparts from the cylinderhead,cleaning. (05hrs) 47. Inspectionofcylinderheadandmanifoldsurfacesforwarping,cracksandflatness.Checkingvalveseats&valveguide– Replacingthe valve if necessary. (05hrs) 48. Check leaks of valve seatsforleakage– Dismantlerockershaftassembly-clean&checkrockershaft-and levers, for wearandcracksandreassemble.(05hrs) 49. Checkvalvesprings,tappets,pushrods,tappetscrewsandvalvestemcap.Reassemblingvalvepartsinsequence,refitcylinderheadandmanifold&rockerarmassembly, adjustablevalveclearances,startingengineafteradjustments. (10 hrs)	- Type of Diesel combustion chambers, - Effect on size of Intake & exhaust passages, Head gaskets. - Importance of Turbulence. Valves & Valve Actuating Mechanism - - Description and Function of Engine Valves, different types, materials, - Type of valve operating mechanism, Importance of Valve seats, Valve seats inserts in cylinder heads, - importance of Valve rotation, Valve stem oil seals, size of Intake valves, Valve trains, Valve- timing diagram, concept of Variable valve timing. - Description of Camshafts &drives , - Description of Overhead camshaft (SOHC and DOHC), importance of Cam lobes, Timing belts & chains, Timing belts &tensioners.(07hrs)
		50. Perform Overhauling piston and connecting rod assembly. Use of service manual for	- Description&functionsof different types of pistons, piston rings and piston pins and

		clearance and other parameters. (05 hrs) 51. Perform Practice on removing oil sump and oil pump – clean the sump. (04 hrs) 52. Perform removing the big end bearing, connecting rod with the piston. (04 hrs) 53. Perform removing the piston rings; Dismantle the piston and connecting rod. Check the side clearance of piston rings in the piston groove & lands for wear. Check piston skirt and crown for damage and scuffing, clean oil holes. (05 hrs) 54. Measure -the piston ring close gap in the cylinder, clearance between the piston and the liner, clearance between crank pin and the connecting rod big end bearing. (03 hrs) 55. Check connecting rod for bend and twist. Assemble the piston and connecting rod assembly. (04 hrs)	materials. - Used recommended clearances for the rings and its necessity precautions while fitting rings, common troubles and remedy. - Compression ratio. - Description & function of connecting rod, - importance of big- end split obliquely - Materials used for connecting rods big end & main bearings. Shells piston pins and locking methods of piston pins. (05 Hrs)
		56. PerformOverhaulingof crankshaft, Use of servicemanual for	- Description and function of Crank shaft, camshaft, - Engine bearings-

		clearance andotherparameters(05hrs) 57. Perform removing damperpulley,timinggear/timing chain,flywheel,mainbearingcaps,bearingshellsandcrankshaftfromengine(05hrs) 58. Inspectoilretainerandthrustsurfacesforwear.(05 hrs) 59. Measurecrankshaftjournalforwear,taperandovality.(05hrs) 60. Demonstratecrankshaftforfilletradii,bend&twist.(05hrs)	classification and location – materials used & composition of bearing materials- Shell bearing and their advantages- special bearings material for diesel engine - Application bearing failure & its causes-care & maintenance. - Crank-shaft balancing, firing order of the engine. (04Hrs)
		61. Inspectflywheelandmountingflanges,spigotandbearing.(05hrs) 62. Checkvibrationdamperfordefect.(02hrs) 63. Performremovingcamshaftfromengineblock,Check for bend & twist ofcamshaft.Inspection ofcamlobe,camshaftjournals and bearings andmeasure cam lobe lift. (05 hrs) 64. Fixingbearinginsertsincylinderblock&capchecknipandspreadclearance&oilholes&locatinglugsfixcrankshaftonblock-torquebolts-	- Description and function of the fly wheel and vibration damper. - Crank case & oil pump, gears timing mark, Chain sprockets, chain tensioner etc. - Function of clutch & coupling units attached to flywheel. (04 Hrs)

		checkendplayremoves haft-checkseating, repeat similarly for connecting rod and Checkseatingandrefit.(08hrs)	
		65. Performcleaningandch eckingofcylinderblocks .(10 hrs) 66. Surfaceforanycrack,flat ness measure cylinderborefortaper& ovality,cleanoilgalleryp assageandoilpipeline. (15hrs) 67. Performreassemblinga llparts of engine in correctsequenceandto rqueallboltsandnutsas perworkshopmanualof theengine.(12hrs) 68. Performtestingcylinder compression,Checkidle speed. (08hrs) 69. Performremoving&rep lacing a cam belt, andadjusting an engine drivebelt,replacingane ngine drivebelt.(05hrs)	- Description of Cylinder block, - Cylinder block construction, - Different type of Cylinder sleeves (liner). (05 Hrs)
Professional Skill50Hrs; ProfessionalKn owledge; 10 Hrs	Trace, Test &Repair CoolingandLubricati on Systemof engine. (Mapped NOS: ASC/N9404)	70. Perform practice on checking & top up coolant, draining & refilling coolant, checking / replacing a coolant hose. (05 hrs) 71. Perform test cooling system pressure. (04	**NeedforCoolingsystems** - -Heat transfer method, - Boiling point & pressure, - Centrifugal force, - Vehicle coolant properties and recommended change of

		hrs) 72. Execute on removing & replacing radiator/ thermostat check the radiator pressure cap. (06 hrs) 73. Test of thermostat. (03 hrs) 74. Perform cleaning &reverse flushing. (08hrs) 75. Perform overhauling water pump and refitting. (07 hrs) 76. Perform checking engine oil, draining engine oil, replacing oil filter, & refilling engine oil (07 hrs) 77. Execute overhauling of oil pump, oil coolers, air cleaners and air filters and adjust oil pressure relief valves, repairs to oil flow pipe lines and unions if necessary. (10 hrs)	interval, - Different type of cooling systems, **Basic cooling systemcomponents** - Radiator, Coolant hoses, - - Water pump, - Cooling system thermostat, Cooling fans, - Temperature indicators, - Radiator pressure cap, Recovery system, Thermo- switch. **Needforlubricationsystem**, - Functions of oil, Viscosity and its grade as per SAE , - Oil additives, Synthetic oils, The lubrication system**,** **Splashsystem,** - Pressure system - Corrosion/noise reduction in the lubrication system. - Lubrication system components - Description and function of Sump, Oil collection pan, Oil tank, Pickup tube, different type of Oil pump & Oil filters Oil pressure relief valve, Spurt holes & galleries, Oil indicators, Oil cooler. (10 hrs)
Professional Skill26Hrs;	Trace & TestIntakeand	78. Execute dismantling air	**Intake&exhaustsystems**– - Description of Diesel

ProfessionalKnowledge 06 Hrs	Exhaust system of engine. (Mapped NOS: ASC/N9405)	compressorandexhauster and cleaning allparts - measuring wear inthe cylinder, reassemblingall parts and fitting themintheengine.(7hrs) 79. Executedismantling&assemblingofturbocharger,checkforaxialclearanceasperservicemanual.(05hrs) 80. Examineexhaustsystemforrubbermountingfordamage,deterioratio nandoutofposition;forleakage,looseconnection,dentanddamage;(08 hrs) 81. Performpracticeonexhaust manifold removalandinstallation,practiceonCatalyticconverterremovalandinstallation.(06 hrs)	induction & Exhaust systems. Description & function of air compressor, exhauster, Super charger, Intercoolers, turbo charger, variable turbo charger mechanism. **Intakesystemcomponents-** - Description and function of Air cleaners,Differenttypeaircleaner,DescriptionofIntakemanifoldsandmaterial**,** **Exhaustsystemcomponents -** - Description and function of Exhaust manifold, Exhaust pipe, Extractors, Mufflers-Reactive, absorptive, Combination of Catalytic converters, Flexible connections, Ceramic coatings, Back-pressure, - Electronic mufflers. (06Hrs)
ProfessionalSkill70Hrs; ProfessionalKnowledge 12Hrs	ServiceDieselFuelSystemandcheckproperfunctionality. (Mapped NOS: ASC/N9406)	82. Performworkonremoving&cleaningfueltanks, checkingleaksinthefuellines. (10hrs) 83. ExecuteoverhaulingofFeedPumps(Mechanical&Electrical).(10hrs) 84. Performbleedingofairfromthefuellines,servicingprimary&secondaryf	**FuelFeedSysteminICEngine (Petrol&Diesel)** - Gravity feed system, Forced feed system, main parts, Fuel Pumps-Mechanical & Electrical - Feed Pumps. - Knowledge about function, working &types of Carburetor.

		ilters.(10hrs) 85. Execute removing a fuelinjectionpumpfro manengine-refit the pump tothe engine re-set timing - filllubricating-oilstartand adjust slow speed oftheengine. (15hrs) 86. Executeoverhaulingofi njectorsandtestingofin jector.(15hrs) 87. Generalmaintenanceof FuelInjectionPumps(FI P).(10hrs)	**DieselFuelSystems** - Description and function of Diesel fuel injection, fuel characteristics, concept of Quiet diesel technology &Clean dieseltechnology. **Diesel fuel systemcompo nents** - Description and function of Diesel tanks & lines, Diesel fuel filters, water separator, Lift pump, Plunger pump, Priming pump, - Inline injection pump, Distributor-type injection pump, Diesel injectors, Glow plugs, Cummins & Detroit Diesel injection. **ElectronicDieselcontrol-** - Electronic Diesel control systems, Common Rail Diesel Injection (CRDI) system, hydraulically actuated electronically controlled unit injector (HEUI) diesel injection system. Sensors, actuators and ECU (Electronic Control Unit) used in Diesel Engines. (12hrs)
ProfessionalSk ill25 Hrs; ProfessionalKn owledge	Plan & overhaul the stationary engine and Governor and	88. Execute Start engine adjustidlingspeedandd amping device	**Marine&StationaryEngine:- Types,** - -double acting engines,

05Hrs	check functionality. (Mapped NOS: ASC/N9404)	inpneumaticgovernorandventurecontrolunitchecking.(06hrs) 89. Verifyperformanceofenginewithoffloadadjustingtimings.Startengine-adjustingidlespeed of the engine fittedwith mechanical governorchecking-highspeedoperationoftheengine.(07 hrs) 90. Checkperformanceformissingcylinderbyisolatingdefectiveinjectorsandtest-dismantleandreplacedefectivepartsandreassembleandrefitback totheengine.(12 hrs)	- opposed piston engines, starting systems, cooling systems, lubricating systems, supplying fuel oil, hydraulic coupling, - Reduction gear drive, electromagnetic coupling, - Electrical drive, generators and motors, supercharging. (05 Hrs)
ProfessionalSkill25 Hrs; ProfessionalKnowledge 05Hrs	Monitoremissionofvehicleandexecutedifferentoperationtoobtainoptimumpollutionasperemissionnorms. (Mapped NOS: ASC/N9404)	91. Monitor emissionsprocedurebyuseofEnginegasanalyserorDieselsmokemeter.(10hrs) 92. Checking&cleaningaPositivecrankcaseventilation(PCV)valve.Obtaining&interpretingscan tool data. InspectionofEVAPcanisterpurgessystembyuseofscanTool.(10hrs) 93. EGR/SCRValveRemoveandinstallationforinspection.(05hrs)	**EmissionControl:-Vehicleemissions** - Standards- Euro and Bharat II, III, IV, V Sources of emission, Combustion, Combustion chamberdesign. **Typesofemissions**: - CharacteristicsandEffectofHydrocarbons,Hydrocarbons in exhaust gases, Oxides of nitrogen, Particulates, - Carbon monoxide, Carbon dioxide, Sulphur content in fuels Description of

			Evaporation emission control, Catalytic conversion,Closed loop, - Crankcase emission control, Exhaust gas recirculation (EGR) valve, controlling air- fuel ratios, Charcoal storage devices, Diesel particulate filter (DPF). Selective Catalytic, Reduction (SCR), EGR VS SCR (05Hrs)
Professional Skill 25 Hrs; Professional Knowledge 05 Hrs	Carryout overhauling of Alternator and Starter Motor. (Mapped NOS: ASC/N9407)	94. Perform removing alternator from vehicle dismantling, cleaning checking for defects, assembling and testing for motoring action of alternator & fitting to vehicles. (15 hrs) 95. Practice on removing starter motor Vehicle and overhauling the starter motor, testing of starter motor (10 hrs)	- Basic Knowledge about DC Generator & AC Generator. - Constructional details of Alternator - Description of charging circuit operation of alternators, regulator unit, ignition warning lamp- troubles and remedy in charging system. - Description of starter motor circuit, - Constructional details of starter motor solenoid switches, common troubles and remedy in starter circuit. (05 Hrs)
Professional Skill 25 Hrs; Professional Knowledge 05 Hrs	Diagnose & rectify the defects in LMV/HMV to ensure functionality of vehicle. (Mapped NOS: ASC/N9408)	96. Execute troubleshooting in LMV/HMV for Engine Not starting – Mechanical & Electrical causes, High	- Troubleshooting : - Causes and remedy for - Engine Not starting Mechanical & Electrical causes, - High fuel consumption,

		fuel consumption, Engine overheating, Low Power Generation, Excessive oil consumption, Low/High Engine Oil Pressure, Engine Noise. (25 hrs)	Engine overheating, - Low Power Generation, - Excessive oil consumption, - Low/High Engine Oil Pressure, Engine Noise. (05 hrs)
ENGINEERING DRAWING:(40 Hrs.)			
Professional Knowledge ED- 40 Hrs.	Read and apply engineering drawing for different application in the field of work. (Mapped NOS: CSC/N9401)	**ENGINEERING DRAWING:** **Introduction to Engineering Drawing and Drawing Instruments** • Conventions • Sizes and layout of drawing sheets • Title Block, its position and content • Drawing Instrument **2. Lines- Types and applications in drawing** Free hand drawing of – • Geometrical figures and blocks with dimension • Transferring measurement from the given object to the free hand sketches. • Free hand drawing of hand tools and measuring tools. **3. Drawing of Geometrical figures:** • Angle, Triangle, Circle, Rectangle, Square, Parallelogram. • Lettering & Numbering – Single Stroke. **4. Dimensioning** • Types of arrowhead • Leader line with text • Position of dimensioning (Unidirectional, Aligned) **5. Symbolic representation** – • Different symbols used in the related trades of Mechanic Auto Body Repair / Electrical and Electronics / Diesel / Tractor / Two and Three-wheeler. **6. Concept and reading of Drawing in** • Concept of axes plane and quadrant • Concept of Orthographic and Isometric projections • Method of first angle and third angle projections (definition and difference) **7. Reading of Job drawing related to** Mechanic Auto Body	