

NSQF QUALIFICATION FILE

Approved in 24th NSQC Dated 27th Feb, 2020

NSDA Code

2020/AUT/DG/03634

CONTACT DETAILS OF THE BODY SUBMITTING THE QUALIFICATION FILE

Directorate General of Training (DGT)
Government of India, Ministry of Skill Development and Entrepreneurship,
1st and 2nd Floor, CIRTES Building
Next to Pusa ITI, Pusa Campus
New Delhi – 110012.

Name and address of submitting body:

Directorate General of Training (DGT)
Government of India, Ministry of Skill Development and Entrepreneurship,
1st and 2nd Floor, CIRTES Building
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New Delhi – 110012.

Name and contact details of individual dealing with the submission

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Position in the organisation: Deputy Director General (C & P)

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List of documents submitted in support of the Qualifications File

1. Competency-based curriculum with following details:

Model Curriculum to be added which will include the following:

- a) Indicative list of tools/equipment to conduct the training: Enclosed with curriculum
- b) Trainers qualification: Indicated in the curriculum
- c) Lesson Plan: All DGT curricula are designed indicating specific practical to be carried out during training along with details of trade theory. Based on this the concerned instructor prepares the Lesson Plan and Demonstration Plan with support of IMPs developed by NIMI,DGT.

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- d) Distribution of training duration into theory/practical/OJT component: Indicated in the curriculum.
- 2. Curriculum for Core Skills (Workshop Calculation & Science, Engineering Drawing and Employability Skills).

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e) SUMMARY

1	Qualification Title	'MECHANIC DIESEL'
2	Qualification Code, if any	DGT/1006
3	NCO code and occupation	7233.0400 - Mechanic, Diesel Engine
4	Nature and purpose of the qualification (Please specify whether qualification is short term or long term)	Prepare skilled Technician to undertake the job roles of Mechanic Diesel and will enable the trainee to overhaul, dismantle, examine, repair and assemble diesel or oil engines for efficient performance as prime mover to drive machinery and equipment. It is a long term qualification.
5	Body/bodies which will award the qualification	Directorate General of Training (DGT).
6	Body which will accredit providers to offer courses leading to the qualification	Directorate General of Training (DGT) accredits the Training providers (ITIs/ NSTIs/MSTIs/BTCs/BTPs / Industries / Establishments).
7	Whether accreditation/affiliation norms are already in place or not , if applicable (if yes, attach a copy)	Yes. The accreditation/ affiliation norms and any amendments made from time to time are available on DGT web portal.
8	Occupation(s) to which the qualification gives access	<ul style="list-style-type: none"> 7233.0400 - Mechanic, Diesel Engine
9	Job description of the occupation	The individual dismantles Diesel Engine of LMV, Overhauling of Cylinder Head, valve train, Piston, connecting rod assembly, crankshaft, flywheel and mounting flanges, spigot and bearings, camshaft etc. Performs testing on engine, repair and maintenance of Cooling, lubrication, Intake & Exhaust system of Engine. Performs maintenance of diesel fuel system, FIP, Governor, monitor emission of vehicle, overhaul of Starter, alternator and troubleshooting in engine of LMV/HMV.
10	Licensing requirements	NOT REQUIRED
11	Statutory and Regulatory requirement of the relevant sector (documentary evidence	NOT APPLICABLE

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	to be provided)			
12	Level of the qualification in the NSQF	Level 4		
13	Anticipated volume of training/learning required to complete the qualification	Sl. No.	Course Element	
			Notional Training Hours	
		1	Professional Skill (Trade Practical)	1000
		2	Professional Knowledge (Trade Theory)	280
		3	Workshop Calculation & Science	80
		4	Engineering Drawing	80
		5	Employability Skills	160
	Total	1600		
14	Indicative list of training tools required to deliver this qualification	As per Annexure-I of curriculum.		
15	Entry requirements and/or recommendations and minimum age	Passed 10th Class with Science and Mathematics. Minimum age 14 years as on first day of academic session		
16	Progression from the qualification (Please show Professional and academic progression)	An Individual can proceed for:		
		Professional <ul style="list-style-type: none"> • Technician • Senior Technician • Supervisor • Manager • Entrepreneur 	Technical / Academic <div style="border: 1px solid black; width: 100px; height: 100px; margin: 10px auto;"></div> ATS CITS Diploma/ Advance Diploma (Vocational)	
17	Arrangements for the Recognition of Prior learning (RPL)	<ul style="list-style-type: none"> • Yes (For more details refer "Guidelines for Private candidate" in DGT website MIS portal). 		
18	International comparability where known (research evidence to be provided)	-		
19	Date of planned review of the	5 Yrs. from the Date of Approval		

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	qualification.			
20	Formal structure of the qualification			
	Mandatory components			
	Title of component and identification code/NOSs/ Learning Outcomes	Estimated size (learning hours)		Level
		Skills	Knowledge	
TRADE SPECIFIC				
(i)	Check & perform Measuring & marking by using various Measuring & Marking tools. (Vernier Callipers, Micrometre, Telescope gauges, Dial bore gauges, Dial indicators, straightedge, feeler gauge, thread pitch gauge, vacuum gauge, tire pressure gauge.)	150	42	3
(ii)	Plan & perform basic fastening & fitting operation by using correct hand tools, Machine tools & equipment.	125	35	3
(iii)	Trace and Test all Electrical & Electronic components & circuits and assemble circuit to ensure functionality of system.	100	28	3
(iv)	Join components by using Arc & Gas welding.	75	21	4
(v)	Trace & Test Hydraulic and Pneumatic components	50	14	4
(vi)	Check & Interpret Vehicle Specification data and VIN. Select & operate various Service Station equipment.	25	7	4
(vii)	Dismantle & assemble of Diesel Engine from vehicle (LMV/HMV) along with other accessories (torqueing methods, handling parts).	50	14	4

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(viii)	Overhaul, service and testing Diesel Engine, its parts and check functionality.	175	49	4
(ix)	Trace, Test & Repair Cooling and Lubrication System of engine (types of coolants and oils relevant to the engines).	50	14	4
(x)	Trace & Test Intake and Exhaust system of engine.(cleaning egr valves, exhaust inlet valves, ports and manifolds)	25	7	4
(xi)	Service Diesel Fuel System and check proper functionality (calibration of mechanical and electronic pumps, checking injectors, filters)	75	21	4
(xii)	Plan & overhaul the stationary engine and Governor and check functionality.	25	7	4
(xiii)	Monitor emission of vehicle and execute different operation to obtain optimum pollution as per emission norms.	25	7	4
(xiv)	Carryout overhauling of Alternator and Starter Motor.	25	7	4
(xv)	Diagnose & rectify the defects in LMV/HMV to ensure functionality of vehicle	25	7	4
CORE SKILL				
EMPLOYBILITY SKILLS				
(i)	Apply safe working practices.	-	20	4
(ii)	Comply with environment regulation and housekeeping.		20	4
(iii)	Interpret & use formal and technical communication.		20	4
(iv)	Apply the concept in productivity & quality management in day to day work to improve productivity & quality.		20	4
(v)	List and interpret various acts of labour welfare legislation.		20	4

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(vi)	Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.		20	4
(vii)	Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.		20	4
(viii)	Utilize basic computer applications and internet to take benefit of IT developments in the industry.		20	4
WORKSHOP CALCULATION & SCIENCE				
(i)	Demonstrate basic mathematical concept and principles to perform practical operations.	-	40	4
(ii)	Explain basic science in the field of study including simple machine.		40	4
ENGINEERING DRAWING				
(i)	Read and apply engineering drawing for different application in the field of work.	-	80	4
	Total		1600	

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21	<p>Body/Bodies which will carry out assessment: Controller of Examinations, DGT</p>
22	<p>How will RPL assessment be managed and who will carry it out? DGT will carry out the RPL assessment following the below mentioned eligibility criteria for Trainee:</p> <p>Applicants aspiring to appear as Private Candidates in the AITT under CTS for award of NTC, have been categorized based on their educational background and experience. Subsequently 'Private Candidates' may be admitted under one of the following categories. Category wise 'eligibility criteria' for appearing as 'Private Candidate' in AITT under CTS has been listed below:</p> <p>Category I: Ex-trainees (successful pass-outs) of ITI</p> <p>A. Ex-trainees of ITI who already possess NTC in one of the trades under CTS, are eligible for applying as Private candidate for an allied trade, provided he/ she fulfils all the conditions regarding educational qualification etc. prescribed for that allied trade. (Refer Annexure III for list of allied trades)</p> <p>B. In addition, the applicant should possess minimum of 1 year experience (as on date of submission of application) post the date of AITT result declaration in the desired allied trade in establishments implementing Apprenticeship Training Scheme (ATS)/ establishments registered under the Apprenticeship portal or registered MSMEs or Entities registered with any government/local authorities / shops covered under Factories Act 1948 and Shops and Establishments Act applicable for the concerned State. II.</p> <p>Category II: 'Ex-trainees (successful pass-outs) and current trainees under CoE scheme</p> <p>A. The applicant should have the minimum prescribed entry qualification and should fulfil eligibility criteria for the desired trade under CTS, in which he/she intends to appear for AITT as Private Candidate. Mapping of CoE trades, with that of regular CTS trades is provided in Annexure IV. CoE candidates must register as 'Private Candidate' under CTS in the relevant/mapped CTS trade only.</p> <p>B. There should be a minimum gap of 1 year between successful completions of CoE training i.e. from the date of result declaration to the date of submission of application for 'Private Candidate' certification.</p> <p>C. During this gap of 1 year, the candidate must have undergone Industry training or gained experience in desired trade in establishments implementing Apprenticeship Training Scheme (ATS)/ establishments registered under the Apprenticeship portal or registered MSMEs or Entities</p>

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	<p>registered with any government/local authorities / shops covered under Factories Act 1948 and Shops and Establishments Act applicable for the concerned State.</p> <p>Category III: SCVT Candidates (admitted till August 2018 session)</p> <p>A. No special provisions have been made for SCVT Trainees to enrol as 'Private Candidate'. Going forward, SCVT trainees have been granted equivalence vide G.S.R 186(E) dated 2nd March 2017 for undergoing apprenticeship training under the Apprentices Act 1961 to obtain 'NAC' (Refer Annexure V).</p> <p>B. Only for SCVT trainees admitted till August 2018 batch, provision has been made for obtaining NTC by appearing in AITT under 'Private Candidate'. Such trainees will continue to be governed by old guidelines for 'Private Candidate'.</p> <p>Category IV: Other Candidates (candidate not falling in any of the above 3 categories, including SCVT trainees enrolled from admission session 2019 onwards)</p> <p>A. The applicant should have the minimum prescribed entry qualification and should fulfil eligibility criteria for the relevant trade under CTS, in which he/she desires to appear for AITT as Private Candidate.</p> <p>B. Applicant should be minimum 21 years of age on the date of submission of application. There is no upper age limit.</p> <p>C. The applicant should possess minimum of 3 years' experience (on the date of submission of application) in the relevant trade in establishments implementing Apprenticeship Training Scheme (ATS)/ establishments registered under the Apprenticeship portal or registered MSMEs or Entities registered with any government/local authorities / shops covered under Factories Act 1948 and Shops and Establishments Act applicable for the concerned State.</p> <p>For updated information please refer to DGT web portal.</p>
23	<p>Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, reliable and fair and show that these are in line with the requirements of the NSQF.</p> <p>(1) Assessment process:</p> <p>The assessment for the qualification is carried out by conducting formative assessments, and end of year examinations (Summative). The formative assessments in respect of each Learning Outcome for practical and related theory are conducted by the concerned instructors for evaluating the knowledge and skill acquired by trainees and the behavioural</p>

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transformation of the trainees. This formative assessment is primarily carried out by collecting evidence of competence gained by the trainees by evaluating them at work based on assessment criteria, asking questions and initiating formative discussions to assess understanding and by evaluating records and reports. Summative assessment is carried out by All India Trade Test on Trade Theory, Trade practical, Workshop Calculation & Science, Engineering Drawing and Employability Skills. The question papers for the theory Examinations contain objective type questions.

The marking pattern and distribution of marks for the qualification are as under:

Marking Pattern			
Sl. No.	Type of Assessment	Subject for the Trade Test	Marks
1	Summative Assessment	Practical	250
2		Trade Theory	100
3		Employability Skills	50
4		Workshop Calculation and Science.	50
5		Engineering Drawing	50
6	Formative assessment based on Learning Outcomes		200
TOTAL:			700

(2) Minimum pass marks:

The minimum pass percent for Trade Practical and Formative assessment is 60% & for all other subjects is 33%. There will be no Grace marks.

Testing and certifications for the course:

Controller of examinations, DGT carries out the assessment and issues National Trade Certificate (NTC) following the norms and guidelines issued by the Directorate from time to time.

Overall assessment strategy:

Assessment of the qualification evaluates trainees to show that they can

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integrate knowledge, skills and values for carrying out relevant tasks as per the defined learning outcomes and assessment criteria. The trainees may choose the preferred language for assessment. The underlying principle of assessment is fairness and transparency. While assessing the trainee, assessor is directed to assess as per the defined assessment criteria against the learning outcomes. The evidence of the competence acquired by the trainees can be obtained by conducting theory and practical examinations, observing the trainees at work, asking questions and initiating discussions to assess, understand and evaluate records and reports. The ultimate objective of the assessment is to assess the candidates as per the defined assessment criteria for the learning outcomes.

Specific Arrangements for assessment:

- Assessment is outcome-based.
- There are formative and summative assessments in Theory and Practical.
- Assessment is carried out in Trade theory, Trade Practical, Workshop

Calculation and Science, Engineering Drawing and Employability Skills.

- While Trade Theory and Trade Practical are used for assessing Trade-related jobs, Workshop Calculation and Science is used to test trainee's numerical and logical skills, Drawing is used to test the ability of the trainee to draw and read sketches and Employability skills is used to test the communication, professional language, leadership, entrepreneurship and team-work abilities of the trainee.
- In addition to demonstration of theory and practical knowledge, trainees get a chance to present total personality.

Quality assurance activities:

Question papers are set by external paper setters/ software generated.

Evaluation of Theory Examinations in Trade, Workshop Calculation & Science, Engineering Drawing and Employability Skill is done by third-party agency.

Trade Practical is examined by External Examiner.

24. Assessment evidences**Title of Component: Formative Assessment Breakup**

(on half yearly average of the learning assessment covered)

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Assessment will be evidence based comprising the following for each Learning Outcome:

Serial No.	Terminal Competency	Maximum Weightage (%)
1	Safety consciousness	15
2	Workplace hygiene	5
3	Attendance/ Punctuality	10
4	Ability to follow Manuals/ Written instructions	5
5	Application of Knowledge	10
6	Skills to handle tools / equipment/ Instruments/ Devices	10
7	Economical use of materials	5
8	Working Strategy	10
9	Quality in workmanship/ Performance	15
10	VIVA	15
	Total Maximum Weightage (%)	100

Pass/Fail

The minimum pass percentage is 60% marks for formative assessment.

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LEARNING OUTCOME WITH ASSESSMENT CRITERIA:

LEARNING OUTCOME (TRADE SPECIFIC)	
LEARNING OUTCOME	ASSESSMENT CRITERIA
FIRST YEAR	
1. 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.) Following safety precautions.	Plan the working principles of measuring instruments and special tools required for auto workshop.
	Select, care and use of measuring instrument.
	Set up the measured value with workshop manual and quality concepts and proper safety.
	Carry out decision on whether to replace or not.
2. Plan & perform basic fastening & fitting operation by using correct hand tools, Machine tools & equipments.	Describe the purpose, use of auto hand tools.
	List the safety rules for hand tools.
	Select the correct tool for the job.
	Set up the tacked pieces in specific position.
	Joint components by Brazing, Soldering, Riveting as per given drawing.
Produce components by different operation (Drilling, Reaming, Taping, Dieting)	
3. Trace and Test all Electrical & Electronic components & circuits and assemble circuit to ensure functionality of system. Charge and test batteries used in vehicle.	Plan and prepare as per procedure and safety methods of soldering the cable ends using an electric soldering iron.
	Use crimping tool to make a circuit joint.
	Explain the connection of an ammeter, voltmeter, and ohmmeter in a circuit trouble shooting.
	State open & short circuit, series and parallel circuits.
	Verify DC series & parallel circuits and its characteristics.
	Check out the open and short circuits in the lighting circuits.
	Verify ohm's law and measure resistance using rheostat.
	Check the voltage drop in the auto electrical system by using multimeter.

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	Trace the auto electrical components by using vehicle wiring circuits.
	Check the condition of the solenoid switch in the starting system.
	Determine the forward to reverse resistance ratio of diodes and identify good / bad diodes.
	Perform battery charging and check
4. Join components by using Arc & Gas welding.	Determine the principles, process of different welding process applicable in automobile industry.
	Demonstrate the edge preparation for butt and fillets welds.
	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.
	Set and tack metals as per drawing.
	Deposit the weld maintaining appropriate technique and safety aspects.
	Cool the welded joint by observing appropriate cooling method. Use post heating, peening etc. as per requirement.
	Clean the joint and inspect the weld for its uniformity and different types of surface defects.
5. Trace & Test Hydraulic and Pneumatic components.	Demonstrate Brake System (Hydraulic& Air).
	Demonstrate Hydraulic Power Steering.
6. Check & Interpret Vehicle Specification data and VIN. Select & operate various Service Station Equipments	Identify of different type of vehicle.
	Identify the different vehicle specification data and information
	Demonstrate the garage, service station different equipment
7. Dismantle & assemble of Diesel Engine from vehicle (LMV/HMV) along with other accessories.Vehicle performance Test	Demonstrate safe handling of lifting equipments.
	Identify the problems in the vehicle
	Perform the periodic testing of lifting equipments.
	Judge whether this Engine needs overhaul or not
	Perform dispose the used engine oil and safety measures in disposal.

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	Perform on vehicle Engine Tests to analyze need of Overall
	Perform sequencing and identifying parts at the time of dismantle and assemble.
	Then Dismantle of Engine & Overhaul is ok, refer below attached screen shot for your reference
8. Overhaul & service Diesel Engine, its parts and check functionality.(Judge weather this Engine needs overhaul or not)	Remove accessories fitted to the engine prior to engine removal.
	Align the left hook of the crane with engine lifting bracket.
	Remove the engine mountings
	Remove the engine from vehicle.
	Mount the engine on the vehicle.
	Align and fit the gear box to the engine.
	Refit the accessories to the engine.
	Set the Timing of the Engine
	Overhaul Valve Actuating Mechanism (Hydraulic latch actuator).
9. Trace, Test & Repair Cooling and Lubrication System of engine	Overhauling of Radiator/ Recovery tank water pump, oil pump, air cleaner
	Check the engine oil pressure at different r.p.ms.
	Overhaul the Oil Pump.
	Set Checking & Top up coolant, Draining & refilling coolant.
	Testing cooling system pressure & Thermostat
	Cleaning & reverse flushing. Overhauling water pump and refitting and repairs to oil flow pipe lines and unions if necessary.
	Check proper functioning of radiator fan (Mechanical/ Electrical / viscous / belt drive).
10. Trace & Test Intake and Exhaust system of engine	Overhauling of manifolds, silencer and tail pipe, air compressor, air exhauster and inspect parts of air exhauster, turbo charger from vehicle.
	Overhauling of air filter, clean & refit air cooler, fuel filter assembly and replace filter elements

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

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	engine oil pressure.
	Diagnose for abnormal engine noise.
	Diagnose for engine's poor performance.

LEARNING OUTCOME (CORE SKILL)	
LEARNING OUTCOME	ASSESSMENT CRITERIA
EMPLOYABILITY SKILLS	
1. Apply safe working practices	Follow and maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements and according to site policy.
	Recognize and report all unsafe situations according to site policy.
	Identify and take necessary precautions on fire and safety hazards and report according to site policy and procedures.
	Identify, handle and store / dispose off dangerous goods and substances according to site policy and procedures following safety regulations and requirements.
	Identify and observe site policies and procedures in regard to illness or accident.
	Identify safety alarms accurately.
	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.
	Identify and observe site evacuation procedures according to site policy.
	Identify Personal Protective Equipment (PPE) and use the same as per related working environment.
	Identify basic first aid and use them under different circumstances.
	Identify different fire extinguisher and use the same as

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	per requirement.
2. Comply with environment regulation and housekeeping	<p>Identify environmental pollution & contribute to the avoidance of instances of environmental pollution.</p> <p>Deploy environmental protection legislation & regulations</p> <p>Take opportunities to use energy and materials in an environmentally friendly manner.</p> <p>Avoid waste and dispose waste as per procedure</p> <p>Recognize different components of 5S and apply the same in the working environment.</p>
3. Interpret & use formal and technical communication.	<p>Obtain sources of information and recognize information.</p> <p>Use and draw up technical drawings and documents.</p> <p>Use documents and technical regulations and occupationally related provisions.</p> <p>Conduct appropriate and target oriented discussions with higher authority and within the team.</p> <p>Present facts and circumstances, possible solutions & use English special terminology.</p> <p>Resolve disputes within the team.</p> <p>Conduct written communication.</p>
4. Apply the concept in productivity & quality management in day to day work to improve productivity & quality.	<p>Explain the concept of productivity and apply during execution of job.</p> <p>Explain the concept of quality tools and apply during execution of job.</p>
5. List and interpret various acts of labour welfare legislation.	<p>Explain basic concept of labour welfare legislation, adhere to responsibilities and remain sensitive towards such laws.</p> <p>Knows benefits guaranteed under various acts.</p>
6. Explain energy conservation, global warming and pollution and contribute in day to day work by	<p>Explain the concept of energy conservation, global warming, pollution and utilize the available resources optimally & remain sensitive to avoid environment pollution.</p> <p>Explain standard procedure for disposal of waste.</p>

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optimally using available resources.	
7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.	<p>Explain personnel finance and entrepreneurship.</p> <p>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.</p> <p>Prepare a report to become an entrepreneur for submission to financial institutions.</p>
8. Utilize basic computer applications and internet to take benefit of IT developments in the industry.	<p>Explain the basic hardware of personal computer.</p> <p>Use common application software viz., word, excel, power point etc., in day to day work.</p> <p>Awareness about useful internet websites, search relevant information pertaining to the assigned tasks.</p>
WORKSHOP CALCULATION & SCIENCE	
1. Demonstrate basic mathematical concept and principles to perform practical operations.	<p>Solve different problems like phase angle, etc. with the help of a calculator.</p> <p>Demonstrate conversion of Fraction to Decimal and vice versa.</p> <p>Explain BCD code, conversion from decimal to binary and vice-versa, all other conversions.</p>
2. Explain basic science in the field of study including simple machine.	<p>Explain concept of basic science related to the field such as Material science, Mass, weight, density, speed, velocity, heat & temperature, force, motion, pressure, heat treatment, centre of gravity, friction.</p> <p>Explain levers and its types.</p> <p>Explain relationship between Efficiency, velocity ratio and Mechanical Advantage.</p> <p>Prepare list of appropriate materials by interpreting detail drawings and determine quantities of such materials.</p> <p>Solve simple problems on lifting tackles like crane- Solution of problems with the aid of vectors.</p>
ENGINEERING DRAWING	
1. Read and apply engineering drawing for	<p>Read & interpret the information on drawings and apply in executing practical work.</p> <p>Read & analyse the specification to ascertain the</p>

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different application in the field of work.	material requirement, tools and assembly/maintenance parameters.
	Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/parameters to carry out the work.

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25. EVIDENCE OF LEVEL

OPTION A

Title/Name of qualification/component: MECHANIC DIESEL			Level: 4
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
Process	<p>Familiar, Predictable, Routine Situations of Clear Choice</p> <ul style="list-style-type: none"> Overhaul, service and testing Diesel Engine, its parts and check functionality. Trace & Test Intake and Exhaust system of engine.(Cleaning egr valves, exhaust inlet valves, ports and manifolds). Trace, Test & Repair Cooling and Lubrication System of engine (types of coolants and oils relevant to the engines). 	<p>In all the learning outcomes for example ‘Overhaul, service and testing Diesel Engine, its parts and check functionality’ and ‘Trace & Test Intake and Exhaust system of engine (cleaning of EGR valves, exhaust inlet valves, ports and manifolds)’, the learner is expected to overhaul, trace and test the Diesel Engine components and thus will be required to work in familiar, predictable, routine and hence situation of clear choice.</p> <p>Thus the NSQF level as per this descriptor will be 4.</p>	4
Professional knowledge	<p>Factual Knowledge of field of Knowledge or study</p> <ul style="list-style-type: none"> Description of internal & external combustion engines, Classification of IC 	<p>The learner is expected to understand and demonstrate knowledge of Internal and External Combustion Engines, Classification of IC engines, Principle & working of 2&4-stroke diesel</p>	4

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Title/Name of qualification/component: MECHANIC DIESEL			Level: 4
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
	<p>engines, Principle & working of 2&4-stroke diesel engine (Compression ignition Engine (C.I)).</p> <ul style="list-style-type: none"> Description and function of Diesel fuel injection, fuel characteristics, concept of Quiet diesel technology & Clean diesel technology. Description and function of Diesel tanks & lines, Diesel fuel filters, water separator, Lift pump, Plunger pump, Priming pump etc. 	<p>engine (Compression ignition Engine (C.I). The learner is expected to possess knowledge of Conventional and Advanced Diesel Fuel Systems, Components of Diesel fuel system , Electronic Diesel control systems, Common Rail Diesel Injection (CRDI) system etc.</p> <p>The above knowledge possessed by the learner are the factual knowledge of this field.</p> <p>Hence NSQF Level 4 for this Descriptor</p>	
Professional skill	<ul style="list-style-type: none"> Dismantle & assemble of Diesel Engine from vehicle (LMV/HMV) along with other accessories (torqueing methods, handling parts). Service Diesel Fuel System and check proper functionality (calibration of mechanical and electronic pumps, checking injectors, filters). 	<p>In learning outcomes like 'Dismantle & assemble of Diesel Engine from vehicle (LMV/HMV) along with other accessories (torqueing methods, handling parts)', 'Service Diesel Fuel System and check proper functionality (calibration of mechanical and electronic pumps, checking injectors, filters)' etc , the learner is able to dismantle and assemble the diesel engine parts, repair and service the same.</p>	4

NSQF QUALIFICATION FILE

Approved in 24th NSQC Dated 27th Feb, 2020

Title/Name of qualification/component: MECHANIC DIESEL			Level: 4
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
	<ul style="list-style-type: none"> Monitor emission of vehicle and execute different operation to obtain optimum pollution as per emission norms. Plan & overhaul the stationary engine and Governor and check functionality. 	<p>Here the learner is expected to recall and demonstrate practical skills which are routine and repetitive in narrow range of application, using appropriate rules and tools and quality concepts.</p> <p>Hence NSQF Level 4 for this Descriptor.</p>	
Core skill	<p>Language to communicate written or oral, with required clarity</p> <ul style="list-style-type: none"> Interpret & use formal and technical communication. <p>Basic Arithmetic and algebraic principles</p> <ul style="list-style-type: none"> Explain science in the field of study including simple machine. <p>Basic Understanding of social/political</p> <ul style="list-style-type: none"> Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth. 	<p>The learning outcomes for example 'Interpret & use formal and technical communication', 'Explain science in the field of study including simple machine' are the learning outcomes where the learner requires to display competence in written language with required clarity, skill of basic arithmetic & algebraic principles in order to understand the work enlisted in the job card/service card and use the measuring & marking tools. The learner will also need to communicate with team supervisor to understand the job and explain ones work.</p> <p>The learner will also need to have basic understanding of social political and natural environment as mentioned in the learning outcome for example 'Explain personnel finance,</p>	4

NSQF QUALIFICATION FILE

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		<p>entrepreneurship and manage/organize related task in day to day work for personal & societal growth'.</p> <p>Hence the NSQF level as per this descriptor will be 4.</p>	
Responsibility	<ul style="list-style-type: none"> Plan & perform basic fastening & fitting operation by using correct hand tools, Machine tools & equipment. Check & Interpret Vehicle Specification data and VIN. Select & operate various Service Station equipment. Check & perform Measuring & marking by using various Measuring & Marking tools (Vernier Callipers, Micrometre, Telescope gauges, Dial bore gauges, Dial indicators, straightedge, feeler gauge, thread pitch gauge, vacuum gauge, tire pressure gauge.) 	<p>The role of Diesel Mechanic is to perform the work as per specifications and on the basis of their own analysis of what needs to be done based on their understanding of Diesel engine working system, compression Ignition Engine Operation and basic Electrical & Electronics concepts, processes, principles and standards.</p> <p>Here the learner is responsible for his own work and learning to ensure the conformance of given job requirements.</p> <p>Hence NSQF Level is 4 for this descriptor</p>	4

NSQF QUALIFICATION FILE

Approved in 24th NSQC Dated 27th Feb, 2020

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NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level

NSQC Approved

NSQF QUALIFICATION FILE

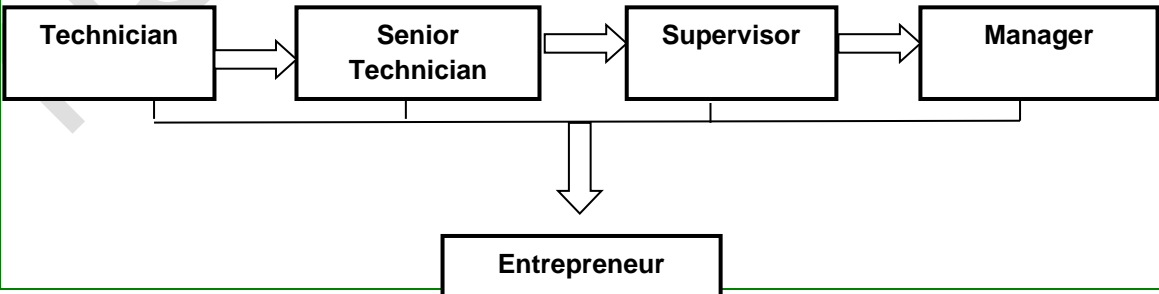
Approved in 24th NSQC Dated 27th Feb, 2020**SECTION 3****EVIDENCE OF NEED**

26	<p>What evidence is there that the qualification is needed? What is the estimated uptake of this qualification and what is the basis of this estimate?</p> <table border="1" data-bbox="339 517 1390 1666"> <thead> <tr> <th data-bbox="339 517 627 663">Basis</th> <th data-bbox="627 517 1390 663">In case of other Awarding Bodies (Institutes under Central Ministries and states departments)</th> </tr> </thead> <tbody> <tr> <td data-bbox="339 663 627 1043">Need of the qualification</td> <td data-bbox="627 663 1390 1043">Automotive Sector has a significant presence of organized as well as unorganized skilled manpower requirement. This sector is poised to grow exponentially in the years to come and is highly labor intensive and there are many emerging trends in this sector. Hence the qualification has been designed keeping in view to cater to the ever-increasing demand of skilled manpower in consultation with stakeholders.</td> </tr> <tr> <td data-bbox="339 1043 627 1469">Industry Relevance</td> <td data-bbox="627 1043 1390 1469">The job role defined for the qualification is as per the National Classification of Occupations 2015 which is developed by Employment Directorate under the ministry of Labour and Employment in collaboration with different industry partners and as per ILO guidelines. Moreover, the training is imparted in ITIs/NSTIs/MSTIs/BTC/ BTPs/ Industries / Establishments etc. where such requirement is available. This justifies the qualification is very much relevant for industry.</td> </tr> <tr> <td data-bbox="339 1469 627 1592">Usage of the qualification</td> <td data-bbox="627 1469 1390 1592">The Proposed qualification will create skilled Technician for various establishments in different Sectors.</td> </tr> <tr> <td data-bbox="339 1592 627 1666">Estimated uptake</td> <td data-bbox="627 1592 1390 1666">The present seating capacity is 99036.</td> </tr> </tbody> </table>	Basis	In case of other Awarding Bodies (Institutes under Central Ministries and states departments)	Need of the qualification	Automotive Sector has a significant presence of organized as well as unorganized skilled manpower requirement. This sector is poised to grow exponentially in the years to come and is highly labor intensive and there are many emerging trends in this sector. Hence the qualification has been designed keeping in view to cater to the ever-increasing demand of skilled manpower in consultation with stakeholders.	Industry Relevance	The job role defined for the qualification is as per the National Classification of Occupations 2015 which is developed by Employment Directorate under the ministry of Labour and Employment in collaboration with different industry partners and as per ILO guidelines. Moreover, the training is imparted in ITIs/NSTIs/MSTIs/BTC/ BTPs/ Industries / Establishments etc. where such requirement is available. This justifies the qualification is very much relevant for industry.	Usage of the qualification	The Proposed qualification will create skilled Technician for various establishments in different Sectors.	Estimated uptake	The present seating capacity is 99036.
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27	<p>Recommendation from the concerned Line Ministry of the Government/Regulatory Body. To be supported by documentary evidences.</p> <p>The qualification originally designed for Craftsman Training Scheme is in existence for many years and approved by DGT (Regulatory Body) under Ministry of Skill Development and Entrepreneurship, Govt. of India.</p>										

NSQF QUALIFICATION FILE**Approved in 24th NSQC Dated 27th Feb, 2020**

28	<p>What steps were taken to ensure that the qualification(s) does (do) not duplicate already existing or planned qualifications in the NSQF? Give justification for presenting a duplicate qualification</p> <p>The qualification is originally designed and approved by DGT for the Craftsman Training Scheme and is in existence for many years. No such duplicate qualification of same duration and competencies exists.</p>
29	<p>What arrangements are in place to monitor and review the qualification(s)? What data will be used and at what point will the qualification(s) be revised or updated? Specify the review process here</p> <ul style="list-style-type: none"> • The research wing of CSTARI & DGT reviews and updates the qualification, in consultation with industries and other stakeholders, on a regular basis by conducting trade committee meetings. • DGT will monitor any duplicity by comparing existing qualifications with upcoming ones in the National Qualifications Register (NQR) and relevant sectors.

SECTION 4**EVIDENCE OF PROGRESSION**

30	<p>What steps have been taken in the design of this or other qualifications to ensure that there is a clear path to other qualifications in this sector? Show the career map here to reflect the clear progression</p> <p>On completion of the training the trainee will have an opportunity to move in vertical/horizontal pathways to promote to higher designations. The learner can further undergo other specialised courses to excel in the relevant field.</p>  <pre> graph LR A[Technician] --> B[Senior Technician] B --> C[Supervisor] C --> D[Manager] B --> E[Entrepreneur] </pre>
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