Model Curriculum

NOS Name: Intermediate Concepts of Commercial vehicle service and repair

NOS Code: ASC/N1317

NOS Version: 1.0

NSQF Level: 4

Automotive Skills Development Council | E-113, Okhla Industrial Estate, Phase- III,
New Delhi-110020

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Training Parameters

Sector	Automotive
Sub-Sector	Service
Occupation	Service and repair
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7231.0107
Aligned to NCO/ISCO/ISIC Code	12th grade pass Or Pursuing 2nd year of diploma (after 10th) Or 11th Grade pass with 1.5 year of relevant experience Or 10th Grade + 2 year NAC/NTC Or 9th Grade pass with 4.5 year of relevant experience Or Previous relevant Qualification of NSQF Level 3.5 (Basic Concept in vehicle service and Repair) with 1.5 year relevant experience (Mandatory with Basic Course in vehicle service and Repair)
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 years
Last Reviewed On	18/02/2025
Next Review Date	18/02/2028
NSQC Approval Date	18/02/2025
Model Curriculum Creation Date	18/02/2025
Model Curriculum Valid Up to Date	18/02/2028
Minimum Duration of the Course	60 Hours 00 Minutes
Maximum Duration of the Course	60 Hours 00 Minutes

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills.

- Perform diagnosing and repairing faults in light, medium and heavy-duty vehicles.
- Perform routine service/maintenance/minor repairs of the light, medium and heavy-duty vehicles.

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
ASC/N1317 – Intermediate course in vehicle servicing and repairing NOS Version No. – 1.0 NSQF Level – 4	**20:00**	**40:00**			**60:00**
Module 1: Introduction to course	01:00	00:00			01:00
Module 2: Preparatory activities for vehicle servicing and repairing	07:00	5:00			12:00
Module 3: Servicing and repairing of vehicle	08:00	27:00			35:00
Module 4: Post-servicing activities	04:00	8:00			12:00
Total Duration	**20:00**	**40:00**			**60:00**

Module Details

Module 1: Introduction to course

Bridge module

Terminal Outcomes:

- Discuss about course structure and its importance.

Duration: *<01:00>*	**Duration**: *<00:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe vehicle servicing and repairing process. • Elaborate standard operating procedures (SOPs) regarding vehicle servicing and repairing • Discuss need of service technician in industry.	
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 2: Preparatory activities for vehicle servicing and repairing

Mapped to ASC/N1317, v1.0

Terminal Outcomes:

- Identify tools and equipment required for servicing and repairing.
- Demonstrate preparatory activities for diagnosing faults and repairing of a vehicle.

Duration: *<07:00>*	**Duration**: *<05:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe VIN / chassis number & engine number codification • List various components /aggregates and the manufacturer's specifications of light, medium and heavy-duty vehicle. • Describe basic technology used in and functioning of various systems and components of the heavy vehicle such as engine, transmission, batteries, body management system, telematics, brake system, air-conditioning systems, active & passive safety system, media and other systems • Describe various types of engines i.e. petrol, diesel, CNG etc. in light, medium and heavy-duty vehicles • Discuss basic technology used, functioning and interconnections of various systems and components of light, medium and heavy-duty vehicle. • Recall vehicle terminology like wheel base, ground clearance, front and rear O/H, wheel track front & rear, overall length, overall height • Recall engine terminology i.e. strokes length/ bore diameter/ number of cylinder/ valve mechanism/ fuels and fuel system • Describe basics of electricity - voltage, current & resistance • Describe series and parallel circuit, • Discuss various sources of information available for assessing service and repair requirements of the vehicle. • Discuss standard schedules and checklists recommended by the OEM/ auto component manufacturer for servicing of light, medium and heavy-duty vehicle.	• Show how to review the job card and understand work to be carried out • Identify the auto components related to the various aggregates in the vehicle • Demonstrate organizational procedure of collecting workshop tools/measuring devices/equipment required for the job and check their condition/calibration • Apply appropriate ways to prepare the vehicle according to nature of job to be performed • Apply appropriate ways to diagnose the faults in the various sub-assemblies of the vehicle, using workshop tools, equipment, checklists and standard OEM operating procedures • Demonstrate engine pre-removal checks /non-invasive diagnostics ~~or~~ using special tools and overhauling methods

• List the types of tools and equipment used in different processes of a light, medium and heavy-duty vehicle maintenance. • List the activities need to perform for preparing a light, medium and heavy-duty vehicle for fault identification and repairing work. • Discuss the safety precautions need to follow during servicing and repairing of a light, medium and heavy-duty vehicle.	

Classroom Aids:

Whiteboard, marker pen, projector

Tools, Equipment and Other Requirements

- PPT's, teaching aids, job card, light, medium and heavy-duty vehicle
- Vehicle, various body parts, engine, tools and equipment, material, consumables, components/aggregates, lubricants, grease, oil, etc.
- Pressure indicators: fuel pressure testers, manifold gauge sets, oil pressure gauges, tire pressure gauges etc., pullers: ball joint separators, bearing pullers, gear puller tools, slide hammers etc., trim or moulding tools: carbon scrapers, gasket scrapers, scrapers, spoons etc., measuring equipment: vernier calipers, micrometre, feeler gauges, multi-metre, flow metre, temp gauge, dial gauge etc., other tools: hand tools, power tools, lifting/jacking equipment, tensioning equipment, security activator etc., tools for other tasks such as cleaning of vehicles, brake bleeding, wheel alignment, AC gas charging etc.
- **Safety materials**: Fire extinguisher, safety gloves, aprons, safety glasses, helmet, safety shoe and first-aid kit
- **Cleaning material**: Tip cleaner, wire brush (M.S.), cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel

Module 3: Servicing and repairing of vehicle

Mapped to ASC/N1317, v1.0

Terminal Outcomes:

- Demonstrate how to use different techniques for diagnosing faults and repairing of a light, medium and heavy-duty vehicle.

Duration: *<08:00>*	**Duration**: *<27:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe emission norms and engine management system basics • Discuss need of periodic maintenance • Discuss importance of lubrication chart • Describe impact of Fuel efficiency Factors affecting Vehicle FE • List probable reasons for Low FE & Rectification process • List spare parts and appropriate grade of lubricants, coolant, oils and grease for service and repair work • Discuss the symptoms of technical faults, their causes and rectification procedures in a light, medium and heavy-duty vehicle. • Describe organizational/professional code of ethics and standards of practice. • List BSIV & BSVI engine complaints • List major factors influencing Tyre Life • List steps of SAP setting, Tandem axle thrust adjustment and Wheel Alignment • Discuss use of computer, on-line application and OEM technical information/assistance portals • Discuss the documents to be maintained w.r.t inspection, troubleshooting and diagnosis of faults. • Describe standard Operating Procedures and vehicle service manuals for repairing, servicing and using workshop tools and equipment	• Demonstrate use of appropriate tools, equipment, and consumables as per nature of job and Standard Operating Procedure (SOP) recommended by the organization • Ensure that correct spare parts and appropriate grade of lubricants, coolant, oils and grease for service and repair work • Apply appropriate ways to inspect and diagnose the engine for mechanical complaint diagnosis • Apply appropriate ways to Inspect and diagnose the engine (in case of CNG engine i5 / i6) for faults and issues • Demonstrate coils spark plug and sleeve service process, components replacement of CNG engine (Oil drain from filters, filter replacement / CNG coil boot by following SOP • Demonstrate use of appropriate Engine Overhauling Kit according to type of engine for diagnosing the issues in the engine • Demonstrate repair/ replacement/ calibration/ of mechanical system/ aggregate of vehicle engine as per the faults and issues diagnosed • Demonstrate injector replacement procedure / injector removal fitment/ injector protection caps usage, injector back leak and bleeding process • Apply appropriate ways to inspect and diagnose transmission system of the vehicle for issues and faults and repair/replace the faulty system/aggregate as per the requirement • Demonstrate clutch bleeding and pressure plate adjustment by following SOP • Apply appropriate ways to inspect and diagnose brake system of the vehicle for issues and faults and repair/replace the

	faulty system/aggregate as per the requirement • Apply appropriate ways to chassis, axle and suspension system of the vehicle for issues and faults and repair/replace the faulty system/aggregate • Demonstrate troubleshooting and repairing of faults in the Electromagnetic retarder of the vehicle • Apply appropriate ways to other systems/aggregates such as tyres, drive line, Lift axle, HVAC systems - electrical and mechanical, steering systems, Telematics systems etc. and repair/replace the faulty system/aggregate as per the requirement • Show how to test electrical/electronic components performance • Apply appropriate ways to inspect and diagnose Vehicle Electrical and Electronics system for issues and faults and repair/replace the faulty system/aggregate as per the requirement • Demonstrate use of diagnostic tools like OBDII, DA Lite tool etc. to conduct DTC diagnosis, Parameters monitoring (Boost Pressure, Rail Pressure, etc. • Apply appropriate ways to clean and condition dismantled mechanical and electrical components prior to assembly
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
• PPT's, teaching aids, job card, light, medium and heavy-duty vehicle • Vehicle, various body parts, engine, tools and equipment, material, consumables, components/aggregates, lubricants, grease, oil, etc. • Pressure indicators: fuel pressure testers, manifold gauge sets, oil pressure gauges, tire pressure gauges etc., pullers: ball joint separators, bearing pullers, gear puller tools, slide hammers etc., trim or moulding tools: carbon scrapers, gasket scrapers, scrapers, spoons etc., measuring equipment: vernier calipers, micrometre, feeler gauges, multi-metre, flow metre, temp gauge, dial gauge etc., other tools: hand tools, power tools, lifting/jacking equipment, tensioning equipment, security activator etc., tools for other tasks such as cleaning of vehicles, brake bleeding, wheel alignment, AC gas charging etc. • **Safety materials**: Fire extinguisher, safety gloves, aprons, safety glasses, helmet, safety shoe and first-aid kit • **Cleaning material**: Tip cleaner, wire brush (M.S.), cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel	

Module 4: Post-servicing activities

Mapped to ASC/N1317, v1.0

Terminal Outcomes:

- Perform post-servicing activities

Duration: *<04:00>*	**Duration**: *<08:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss need of checking the performance of vehicle/aggregate post repair. • List tasks assigned before releasing the vehicle for the next procedure. • List documentation required on the job regarding the basic details of repair, maintenance and service performed	• Apply appropriate ways to check the performance of vehicle/aggregate post repair • Ensure completeness of tasks assigned before releasing the vehicle for the next procedure • Apply appropriate ways to dispose of materials such as old batteries, scrap of failed parts/aggregates as per organization's policies • Demonstrate organizational procedure of returning leftover consumable/parts, tools/equipment, and report if any malfunctions are observed to the person concerned
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
• PPT's, teaching aids, job card, light, medium and heavy-duty vehicle • Vehicle, various body parts, engine, tools and equipment, material, consumables, components/aggregates, lubricants, grease, oil, etc. • Pressure indicators: fuel pressure testers, manifold gauge sets, oil pressure gauges, tire pressure gauges etc., pullers: ball joint separators, bearing pullers, gear puller tools, slide hammers etc., trim or moulding tools: carbon scrapers, gasket scrapers, scrapers, spoons etc., measuring equipment: vernier calipers, micrometre, feeler gauges, multi-metre, flow metre, temp gauge, dial gauge etc., other tools: hand tools, power tools, lifting/jacking equipment, tensioning equipment, security activator etc., tools for other tasks such as cleaning of vehicles, brake bleeding, wheel alignment, AC gas charging etc. • **Safety materials**: Fire extinguisher, safety gloves, aprons, safety glasses, helmet, safety shoe and first-aid kit • **Cleaning material**: Tip cleaner, wire brush (M.S.), cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel	

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
ITI	Mechanic Motor Vehicle/Mechanic Auto Electrical and Electronics/ Diesel Mechanic	4	Industry	1	Industry	NA
ITI	Mechanic Motor Vehicle/Mechanic Auto Electrical and Electronics/ Diesel Mechanic	5	Industry	0	Industry	**NA**
Diploma	Mechanical / Automobile	3	Industry	1	Industry	**NA**
Diploma	Mechanical / Automobile	4	Industry	0	Industry	**NA**
Certificate	NSQF Level 4.5 (Four Wheeler Master Technician)	3	Industry	1	Industry	**NA**

Trainer Certification	
Domain Certification	**Platform Certification**
Certified for NOS "Intermediate Concepts of Commercial vehicle service and repair" mapped to NOS: "ASC/N1317, version 1.0". Minimum accepted score is 80%.	Certified for the Job Role: "Trainer (Vet and Skills)", mapped to the Qualification Pack: "MEP/Q2601, v2.0". The minimum accepted score as per MEPSC guidelines is 80%.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
ITI	Mechanic Motor Vehicle/Mechanic Auto Electrical and Electronics/ Diesel Mechanic	5	Industry	1	Industry	NA
ITI	Mechanic Motor Vehicle/Mechanic Auto Electrical and Electronics/ Diesel Mechanic	6	Industry	0	Industry	**NA**
Diploma	Mechanical / Automobile	4	Industry	1	Industry	**NA**
Diploma	Mechanical / Automobile	5	Industry	0	Industry	**NA**
Certificate	NSQF Level 4.5 (Four Wheeler Master Technician)	4	Industry	1	Industry	**NA**

Assessor Certification	
Domain Certification	**Platform Certification**
Certified for NOS "Intermediate Concepts of Commercial vehicle service and repair" mapped to NOS: "ASC/N1317, version 1.0". Minimum accepted score is 80%.	Certified for the Job Role: "Assessor (Vet and Skills)", mapped to the Qualification Pack: "MEP/Q2701, v2.0". The minimum accepted score as per MEPSC guidelines is 80%.

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Assessment Strategy

1. Assessment System Overview:
   - Batches assigned to the assessment agencies for conducting the assessment on SDMS/SIP or email
   - Assessment agencies send the assessment confirmation to VTP/TC looping SSC
   - Assessment agency deploys the ToA certified Assessor for executing the assessment
   - SSC monitors the assessment process & records

2. Testing Environment:
   - Confirm that the centre is available at the same address as mentioned on SDMS or SIP
   - Check the duration of the training.
   - Check the Assessment Start and End time to be as 10 a.m. and 5 p.m.
   - If the batch size is more than 30, then there should be 2 Assessors.
   - Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
   - Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
   - Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.
   - Check the availability of the Lab Equipment for the particular Job Role.

3. Assessment Quality Assurance levels / Framework:
   - Question papers created by the Subject Matter Experts (SME)
   - Question papers created by the SME verified by the other subject Matter Experts
   - Questions are mapped with NOS and PC
   - Question papers are prepared considering that level 1 to 3 are for the unskilled & semi-skilled individuals, and level 4 and above are for the skilled, supervisor & higher management
   - Assessor must be ToA certified & trainer must be ToT Certified
   - Assessment agency must follow the assessment guidelines to conduct the assessment

4. Types of evidence or evidence-gathering protocol:
   - Time-stamped & geotagged reporting of the assessor from assessment location
   - Centre photographs with signboards and scheme specific branding
   - Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
   - Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos

5. Method of verification or validation:
   - Surprise visit to the assessment location
   - Random audit of the batch
   - Random audit of any candidate

6. Method for assessment documentation, archiving, and access
   - Hard copies of the documents are stored
   - Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage
   - Soft copies of the documents & photographs of the assessment are stored in the Hard Drives

References

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training.
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module. A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
SOP	Standard Operating Procedure
WI	Work Instructions
PPE	Personal Protective equipment