



Model Curriculum

QP Name: Wheel Loader Operator

QP Code: IES/Q0105

QP Version: 3.0

NSQF Level: 4

Model Curriculum Version: 1.0

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Table of Contents

Training Parameters	3
Program Overview.....	4
Training Outcomes	4
Compulsory Modules.....	4
Module Details	5
Annexure.....	14
Trainer Requirements.....	14
Assessor Requirements.....	15
Assessment Strategy.....	166
References	17
Glossary.....	177
Acronyms and Abbreviations	188

Training Parameters

Sector	Infrastructure Equipment
Sub-Sector	Equipment Operation
Occupation	Operator
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/ 8342.2101
Minimum Educational Qualification and Experience	8th Grade pass with 2 year NTC plus 1 year NAC OR 10th Grade pass plus 1 year NTC/ NAC OR 10th Grade pass with 2 years of relevant experience OR 10th Grade pass and pursuing continuous schooling OR 11th Grade Pass
Pre-Requisite License or Training	Light Commercial Vehicle Driving License (LCV) is preferred
Minimum Job Entry Age	18 Years
Last Reviewed On	17/11/2022
Next Review Date	17/11/2025
NSQC Approval Date	17/11/2022
QP Version	3.0
Model Curriculum Creation Date	30/10/2022
Model Curriculum Valid Up to Date	17/11/2025
Model Curriculum Version	1.0
Minimum Duration of the Course	420 Hours
Maximum Duration of the Course	420 Hours

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:

- Know the organization's procedures and guidelines related to wheel loader operations
- Know the controls, levers and switches in order to operate the wheel loader properly
- Understand all the typical occupational hazards and techniques to be overcome
- Employ safe practices to use the tools and equipment
- Understand how to operate the wheel loader for various applications
- Understand and know the different attachments options available for the machine
- Understand and know periodic maintenance, all checks and service intervals

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
Bridge Module	4	0	0	0	4
NOS Code – IES/N 0113 NOS Name: Carry out pre-operation checks on wheel loader NOS Version - 3.0 NSQF Level - 4	30	30	60	0	120
NOS Code – IES/N 0114 NOS Name – Operate a wheel loader NOS Version - 3.0 NSQF Level - 4	30	60	30	0	120
NOS Code - IES/N 0115 NOS Name - Carry out maintenance and troubleshooting of the wheel loader NOS Version - 3.0 NSQF Level - 4	30	30	60	0	120
NOS Code - IES/N 7601 NOS Name - Comply with worksite health and safety guidelines NOS Version - 3.0 NSQF Level - 4	0	30	0	0	30
NOS Code - DGT/VSQ/N0101 NOS Name - Employability Skills 30 hrs NOS Version 1.0	0	30	0	0	30
Total Duration	90	180	150	0	420

Module Details

Module 1: Orientation

Bridge Module

Terminal Outcomes:

- Describe the operations of the infrastructure industry in India.
- Outline the skill training schemes in Skill Sector Councils.
- Know about the different types of job roles available in IESC.
- Understand the roles and responsibilities of the Wheel Loader Operator.

Duration: <4:00>	Duration: <0:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe employment opportunities in the industry. • Explain the roles and responsibilities of a Wheel Loader Operator. • Describe the different technical trainings conducted in SSC. 	NIL
Classroom Aids:	
Computer, projector, printer, student table, whiteboard, flip chart, markers and duster	
Tools, Equipment and Other Requirements	

Module 2: Pre-op checks on Wheel Loader

Mapped to NOS Code – IES/N0113 v 3.0

Terminal Outcomes:

- Explain the organization’s procedures and guidelines related to wheel loader operations.
- Explain the responsibilities of the assigned job role.
- Understand job-specific documentation and its importance such as daily maintenance checklist, operation handbook and components manual.
- Understand the risks and consequences of not adhering to established processes and job instructions.
- Know the reporting structure in the organization, schedule for resolving the complaint/problem and escalation matrix for reporting unresolved problems.
- Know the emergency organization of the specific work site.

Duration: <30:00>	Duration: <90:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Introduction to the engine and transmission, as well as their use and purpose. • Explain the process for adding fuel and coolant to the compactor. • Describe the method to identify the grade and quality of oil to be used. • Describe the working of various controls, levers, switches, instrument panel & fuse box of the machine. • Identify various tools provided with the machine, explain their use and the importance of putting them back after use. • Explain why the operator should walk around the wheel loader before starting it, to make sure no one is beneath it. • Explain the importance of greasing and oiling pivots and pins that require routine lubrication. • Explain the use of the Operator Handbook and Components Manual. • List typical occupational 	<ul style="list-style-type: none"> • Demonstrate the process to examine the bucket cutting edge, loader’s structure and the lift mechanism for signs of excessive wear. • Demonstrate the process to inspect the tyres, wheels, lug nuts, and stem caps for inflation, leaks and damage • Illustrate how to inspect the tanks, transmission, axles, tilt cylinders, pipes and hoses for leaks or damage. • Describe the process of draining moisture from air tanks in case it is equipped with air brakes. • Demonstrate how to check the fluid and liquid levels in the engine, hydraulic tank, fuel tank, gearbox, radiator, and brakes for conformity to the manufacturer's specifications. • Test that the parking brake, main horn, reverse horn, and headlights are in good working order. • Examine the different controls, gauges, warning lights, and other safety devices to ensure that they are working properly.

<p>hazards and techniques for dealing with them.</p> <ul style="list-style-type: none"> • Know the cost of the equipment and loss to the organization resulting from its damage and the direct/indirect cost of accidents. • Know the recommended optimal engine oil pressure and radiator coolant temperature. • Read instructions, guidelines /procedures/rules related to the worksite and equipment operations. • Explain the importance of using cabin controls and different operating modes and selection procedures and usage of the wheel loader in sequence of operation. • Know the safety interlocks and their functions during start and stop of machine • Know the function of the parking brake • Explain the function of service braking system on the machine and how to check the brake disk in the wheel hub. • Explain in the detail the importance of the latest emission norms in force since 01st Oct, 2021 and the major pollutant emissions in the exhaust gas. • Explain the EATS system and the EGR system & functions of DOC, SCR, DPF, ASC. 	<ul style="list-style-type: none"> • How to operate the wheel loader during face loading and Load & Carry Operation. • How to switch on and off Boom Suspension System and avoid usage of load & carry operation – this is a safety procedure to be followed to prevent damage of tyres and equipment. • Selection of various switches during operation. • Understand the importance of not to park on the slopes of the ramp as well as mines where trucks are plying; to avoid accidents. • Understand the location of EATS components, Ad Blue and its role in Emission control, fill quantities and the importance of reduced Ad Blue levels leading to severe inducement on the machine leading to stoppage of work at site. • Know and identify the locations of various oil filling / drain points and identify location of all filters. • Know in detail the maintenance functions of the wheel loader; understand the importance of preventive maintenance to reduce time.
<p>Classroom Aids:</p>	
<p>Computer, projector, printer, student table, whiteboard, flip chart, markers and duster Manufacturer’s Service and Repair Manual</p>	
<p>Tools, Equipment and Other Requirements</p>	
<p>Safety Gear, Tool Kit, PPE</p>	

Module 3: Operation of a Wheel Loader

Mapped to NOS Code – IES/N0114 v 3.0

Terminal Outcomes:

- Explain the responsibilities of the assigned job role.
- Explain the controls, levers and switches for proper operation of the wheel loader.
- Know how to perform all pre-use and on-the-job inspections.
- Describe the process for documenting maintenance activities in the logbook and its importance.
- Outline the safety standards & procedures followed in the organization.

Duration:<30:00>	Duration:<90:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • List different types of wheel loaders and their applications and functions. • Understand controls, levers and switches in order to operate the wheel loader properly. • Communicate the general safety rules for operating a wheel loader. • Walk around the wheel loader before starting it, to make sure no one is beneath it. • Elaborate the use of the ignition switch and mechanism to start the engine in extreme cold conditions. • Discuss the engine and transmission, as well as their use and purpose. • Understand significance of greasing and oiling parts of the wheel loader. • identify immediate or temporary solutions to resolve mechanical issues. • Learn common hazards in the work area and procedures to deal with them. • Describe the risk and consequences of failing to follow clearly specified procedures/work instructions. 	<ul style="list-style-type: none"> • Show how to wear the seatbelt and adjust the seat position • Know position and operation of the emergency stop button. • Describe the instrument panel, its position, and its functionality. • Demonstrate how to adjust the machine's speed and direction in accordance with the requirement. • Demonstrate the safe movement of the load around the site. • Show how to test check product load in order to avoid overloading during operations. • Demonstrate turning radius of the equipment and safe operation in limited space. • Show steering techniques and the proper way to steer on a slope. • Give examples of all signs, warnings, and other emergency signals.
Classroom Aids:	
Computer, projector, printer, student table, whiteboard, flip chart, markers and duster Manufacturer's Service and Repair Manual	
Tools, Equipment and Other Requirements	
Safety Gear, Tool Kit, PPE	

Module 4: Routine maintenance and trouble shooting

Mapped to NOS Code: IES/N0115 v 3.0

Terminal Outcomes:

- Explain the responsibilities of the assigned job role.
- Communicate the reporting structure in the company.
- Show how to monitor machine working hours to determine the best service plan.
- List all the typical occupational hazards and techniques to overcome them.
- Illustrate the importance of greasing and oiling parts of the wheel loader

Duration: <30:00>	Duration: <90:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Elaborate the fundamental mechanical system at work in the different operations of the wheel loader. • Outline the performance standards & procedures followed in the company. • Define safety protocols to be observed before undertaking any repair. • Define the scope of the position and when and to whom to escalate for help. • Identify common defects and general causes of breakdown. • Explain the importance of the optimal levels of control indicators e.g. fuel gauge, engine oil pressure and temperature. • Describe the importance of regular cleaning of air filter dust bowls. • Identify the potential causes of any unusual noises coming from the engine. • Identify prominent places on the equipment for display of safety and maintenance stickers. • Describe importance of daily greasing of all greasing pins and pivot points. 	<ul style="list-style-type: none"> • Create a checklist for pre operation inspection of the equipment to detect damage, flaws, cracks or leaks. • Create daily /weekly maintenance sheets in conformance with organization recommendation. • Carry out periodic maintenance as per the checklist. • Demonstrate how to use appropriate props /support devices while doing maintenance. • Demonstrate how to clean the air filter dust bowls. • Demonstrate the procedure to check and maintain air pressure in the tyres and the tightness of the wheel nuts. • Prepare a daily top-up plan of coolants, lubricants and fluids to ensure conformity with the manufacturer’s specifications. • Demonstrate how to drain water and debris from the fuel tank.

Classroom Aids:
Computer, projector, printer, student table, whiteboard, flip chart, markers and duster Manufacturer's Service and Repair Manual
Tools, Equipment and Other Requirements
Safety Gear, Tool Kit, PPE

Module 5: Health and safety

Mapped to NOS Code: IES/N 7601 v3.0

Terminal Outcomes:

- Describe the guide lines for health, safety and security requirements.
- Identify the common hazards and risks at the workshop and at site.
- Employ safe practices to use the tools and machines.
- Explain emergency procedures to stop and shutdown machinery.
- Know basic first-aid treatment for common injuries.
- Demonstrate the operation of fire-fighting equipment.
- Elaborate the procedure for storage and disposal of hazardous materials and waste.
- Design various safety signs, symbols and warnings for use in the work place.

Duration: <10:00>	Duration: <20:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the Health, safety, environmental (HSE) policies. • Explain the reporting procedure for all HSE activities. • Display the contact details of HSE personnel, in case of emergencies. • Report all health and safety related incidents/accidents. • Explain safe working practices to avoid common hazards and risks. • Categorize waste on the basis of non- recyclable, hazardous and recyclable material. 	<ul style="list-style-type: none"> • Prepare a hazard log register to report incidents and accidents. • Show the correct use of Personal Protective Equipment (PPE). • Demonstrate safe procedure for lifting loads. • Demonstrate the operation of fire extinguishers. • Demonstrate how to give basic first aid. • Conduct a mock drill for dealing with emergencies like fires and other calamities. • Demonstrate safe storage and disposal of waste.
Classroom Aids:	
Computer, projector, printer, student table, whiteboard, flip chart, marker and duster	
Tools, Equipment and Other Requirements	
Fire Extinguishers, Personal Protective Equipment and other safety gears	

Module 6: Employability Skills

Mapped to NOS: DGT/VSQ/N0101

Terminal Outcomes:

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

- Discuss the importance of Employability Skills in meeting the job requirements
- Show how to practice different environmentally sustainable practices
- Display positive attitude, self -motivation, problem solving, time management skills and continuous learning mind-set in different situations
- Demonstrate how to communicate in a well -mannered way with others
- Demonstrate working with others in a team
- Show how to conduct oneself appropriately with all genders and PwD
- Discuss the significance of reporting sexual harassment issues in time
- Discuss the significance of using financial products and services safely and securely
- Explain the significance of approaching the concerned authorities in time for any exploitation as per legal rights and laws
- Show how to operate digital devices and use the associated applications and features, safely and securely
- Discuss the significance of using internet for browsing, accessing social media platforms, safely and securely
- Discuss the need for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenges
- Explain the significance of identifying customer needs and addressing them
- Create a biodata
- Use various sources to search and apply for jobs
- Discuss the significance of dressing up neatly and maintaining hygiene for an interview
- Discuss how to search and register for apprenticeship opportunities
- Describe opportunities as an entrepreneur

Duration: <00:00>	Duration: <30:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • NA 	<ul style="list-style-type: none"> • Discuss the importance of Employability Skills in meeting the job requirements • Show how to practice different environmentally sustainable practices • Display positive attitude, self -motivation, problem solving, time management skills and continuous learning mind-set in different situations • Demonstrate how to communicate in a well -mannered way with others • Demonstrate working with others in a team • Show how to conduct oneself appropriately with all genders and PwD • Show how to operate digital devices and use the associated applications and features, safely and securely • Explain the significance of identifying customer needs and addressing them • Create a biodata • Use various sources to search and apply for jobs • Discuss the significance of dressing up neatly and maintaining hygiene for an interview • Describe opportunities as an entrepreneur
Classroom Aids:	
Computer, projector, printer, student table, whiteboard/flip chart, marker, duster	
Tools, Equipment and Other Requirements	

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
CLASS VIII		3	2	1		

Trainer Certification	
Domain Certification	Platform Certification
<p>Certified for Job Role: Wheel Loader Operator Mapped to QP: IES/Q0105 Version2.0. Minimum accepted score 70%.</p>	<p>Certified for Job Role: Wheel Loader Operator Minimum accepted score 70%.</p>

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
CLASS VIII		3	2	1		

Assessor Certification	
Domain Certification	Platform Certification
Certified for Job Role: Wheel Loader Operator Mapped to QP: IES/Q0105 - Version2.0 Minimum accepted score 70%.	Certified for Job Role: Wheel Loader Operator Minimum accepted score 70%.

Assessment Strategy

Criteria for assessment for Qualification Pack have been laid down based on the NOS's.

Each Performance Criteria (PC) has been assigned marks proportional to its importance within NOS and weightages have also been given among the NOSs accordingly.

The assessment of the theory/knowledge will be based on written test/viva or both while skill test shall be hands on practical.

Behavior and attitude will be assessed while performing the assigned task.

The assessment shall be done as per the guidelines formulated by IESC.

The assessment agencies in consultation with IESC will create unique question papers for theory/knowledge and practical skills at each IESC accredited testing centers (as per assessment criteria below)

To pass the Qualification Pack, every trainee should score a minimum of 70%.

In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification pack.

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

Term	Description
QP	Qualification Pack
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards
PMKVY	Pradhan Mantri Kaushal Vikas Yojana
QRC	Qualification Review Committee
SSC	Sector Skill Council
SDMS	Skill Development Management System
SIP	Skill India Portal
HSE	Health Safety Environment
PPE	Personal Protective Equipment
PwD	Persons with disabilities