

# QUALIFICATION PACK – OCCUPATIONAL STANDARD FOR INFRASTRUCTURE EQUIPMENT INDUSTRY

## What are Occupational Standards(OS)?

- OS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- OS are performance standards that individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding



## Contents

1. Introduction and Contacts..... Page no. 1
2. Qualifications Pack.....Page no.2
3. OS Units.....Page no.2
4. Glossary of Key Terms .....Page no.3

## Introduction

### Qualification Pack - Backhoe Loader Operator

<b>SECTOR:</b>	INFRASTRUCTURE EQUIPMENT
<b>SUB SECTOR:</b>	Equipment Operations
<b>OCCUPATION:</b>	Operator
<b>REFERENCE ID:</b>	IES/Q0101
<b>ALIGNED TO:</b>	NCO-2004/8332.22

**Brief Job Description:** A backhoe operator drives and controls the backhoe operations; safely and as per schedule. He operates the various attachments, as applicable and knows their respective functions. He is responsible for the maintenance of the equipment.

**Personal Attributes:** This job requires the individual to have good hand eye coordination as also comply with industry regulations. Willingness to work, strong work ethics, and courteous behavior with co – workers are equally desirable. He should also be physically agile, strong, have good eye sight and not suffer from colour-blindness.

<b>Qualifications Pack Code</b>	<b>IES/Q0101</b>		
<b>Job Role</b>	<b>Backhoe Loader Operator</b>		
<b>Credits(NSQF)</b>	<b>TBD</b>	<b>Version number</b>	<b>1.0</b>
<b>Sector</b>	<b>Infrastructure Equipment</b>	<b>Drafted on</b>	<b>16/02/15</b>
<b>Sub-sector</b>	<b>Equipment Operations</b>	<b>Last reviewed on</b>	<b>31/03/15</b>
<b>Occupation</b>	<b>Operator</b>	<b>Next review date</b>	<b>31/03/17</b>
<b>NSQC clearance on</b>	<b>31/03/15</b>		

<b>Job Role</b>	<b>Backhoe Loader Operator</b>
<b>Role Description</b>	A backhoe operator drives and controls the backhoe operations; safely and as per schedule. He operates the various attachments, as applicable and knows their respective functions He is responsible for the maintenance of the equipment.
<b>NSQF level</b>	4
<b>Minimum Educational Qualifications*</b>	Preferably Class VIII
<b>Maximum Educational Qualifications*</b>	NA
<b>Training</b> (Suggested but not mandatory)	Certification Training in Backhoe Loader Operations preferred. Must have a valid Heavy Commercial Vehicle Driving License (HCV)
<b>Minimum Job Entry Age</b>	Preferably 18 years
<b>Experience</b>	In lieu of minimum qualification, the incumbent should have 2 years' experience in driving backhoe loader.
<b>Applicable National Occupational Standards (NOS)</b>	<p><b>Compulsory</b></p> <ol style="list-style-type: none"> <li>1. <a href="#">IES/N0101Carry out pre-operation checks for backhoe operations</a></li> <li>2. <a href="#">IES/N0102Operate a backhoe loader</a></li> <li>3. <a href="#">IES/N0103Carry out maintenance and troubleshooting of the backhoe loader</a></li> <li>4. <a href="#">IES/N7601Comply with worksite health and safety guidelines</a></li> </ol> <p><b>Optional:</b> N.A.</p>
<b>Performance Criteria</b>	As described in the relevant OS units

Keywords /Terms	Description
Sector	Sector is a conglomeration of different business operations having similar businesses and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Vertical	Vertical may exist within a sub-sector representing different domain areas or the client industries served by the industry.
Occupation	Occupation is a set of job roles, which perform similar/related set of functions in an industry.
Function	Function is an activity necessary for achieving the key purpose of the sector, occupation, or area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of OS.
Sub-functions	Sub-functions are sub-activities essential to fulfil achieving the objectives of the function.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organization.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the knowledge and understanding; he/she needs to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria	Performance Criteria are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are Occupational Standards which apply uniquely in the Indian context.
Qualifications Pack Code	Qualifications Pack Code is a unique reference code that identifies a qualifications pack.
Qualifications Pack(QP)	Qualifications Pack comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A Qualifications Pack is assigned a unique qualification pack code.
Unit Code	Unit Code is a unique identifier for an Occupational Standard, which is denoted by an 'N'.
Unit Title	Unit Title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to find the required one.
Scope	Scope is the set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on the quality of required performance.
Knowledge and Understanding	Knowledge and Understanding are statements which together specify the technical, generic, professional and organizational specific knowledge that an individual needs in order to perform up to the required standard.

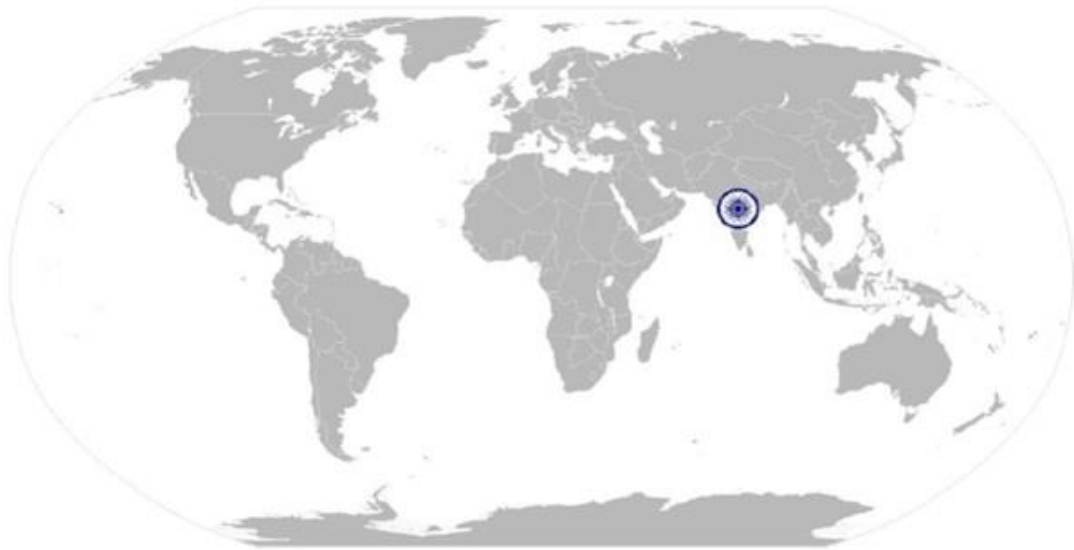
**Acronyms**

Keywords /Terms	Description
OS	Occupational Standard(s)
NOS	National Occupational Standard(s)
QP	Qualifications Pack
NSQF	National Skill Qualifications Framework
ITI	Industrial Training Institute
HCV	Heavy Commercial Vehicle
SHE	Safety Health and Environment
SOP	Standard Operating Procedure
TBD	To Be Determined

**Carry out pre-operation checks for backhoe operations**

---

# National Occupational Standard



## **Overview**

This unit provides Performance Criteria, Knowledge & Understanding and Skills & Ability for activities that need to be carried out to prepare the backhoe loader for a shift.

## Carry out pre-operation checks for backhoe operations

<b>Unit Code</b>	<b>IES/N0101</b>
<b>Unit Title (Task)</b>	<b>Carry out pre-operation checks for backhoe operations</b>
<b>Description</b>	This unit provides Performance Criteria, Knowledge & Understanding and Skills & Ability for activities that need to be carried out to prepare the backhoe loader for a shift.
<b>Scope</b>	This unit/task covers the following: <ul style="list-style-type: none"> <li>• Pre-operation checks</li> <li>• Documentation and Reporting</li> </ul>
<b>Performance Criteria(PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>
<b>Pre - operation Checks</b>	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC1. Examine the backhoe loader body to ensure that the body components are free of cracks and wear</p> <p>PC2. Confirm that the boom and the stick are without dents and cracked welds</p> <p>PC3. Check the differential and hydraulic oil levels to ensure that they are as per manufacturer's indicators</p> <p>PC4. Check the hydraulic hose and ram for leakages</p> <p>PC5. Conduct checks to ensure proper condition of parking brake, main horn, reverse horn and head light</p> <p>PC6. Confirm fan belt tension, electrolyte level and terminal tightness are as per requirement</p> <p>PC7. Get visual inspection conducted to check the various controls, gauges, warning lamp and other safety devices</p> <p>PC8. Check load chart is displayed in cabin</p> <p>PC9. Check and adjust driving position, rear and side mirrors, seat belts and set them as per comfort level</p> <p>PC10. Inspect the air filters and check the gasket and inner filter to ensure that the air filter dust bowls are cleaned</p> <p>PC11. Drain water and sediment from the fuel tank</p> <p>PC12. Check to make sure coolant and oil in engine, transmission, etc. are topped up if necessary as per manufacturer's indicators</p> <p>PC13. Inspect the greasing points to ensure that all greasing pins and pivots points are appropriately greased</p> <p>PC14. Examine the compressor unit and all fittings and air lines</p> <p>PC15. Check clearance of the drawbar ball and socket, look for excessive free-play, and adjust if necessary</p> <p>PC16. Ensure the locking bar is in position to prevent the front and rear chassis moving and creating a crushing zone (articulated machines only)</p> <p>PC17. Keep footplates and steps clean and free from mud, dirt and oil</p> <p>PC18. Certify that the backhoe loader has no one under or on the machine before operating</p>
<b>Documentation and Reporting</b>	<p>PC19. Maintain a checking/maintenance logbook to record all activities performed before starting the backhoe</p> <p>PC20. Report defects precisely to the supervisor if beyond scope of his role</p>

## Carry out pre-operation checks for backhoe operations

Knowledge and Understanding (K)	
<b>A. Organizational Context</b> (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. The organization's procedures and guidelines related to backhoe loader operations</p> <p>KA2. The performance standards &amp; procedures followed in the company</p> <p>KA3. Reporting structure in the company</p> <p>KA4. Escalation matrix for reporting unresolved problems</p> <p>KA5. Timeframe in which the complaint/problem should be resolved</p> <p>KA6. Work target and review mechanism with supervisor for obtaining/giving feedback related to performance process</p> <p>KA7. Location of tools</p> <p>KA8. Contact person in case of queries on procedure or products</p> <p>KA9. Location and process for storage and disposal of waste material</p> <p>KA10. Safety Policy of the company</p>
<b>B. Technical Knowledge</b>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. Responsibilities of the assigned job role</p> <p>KB2. Different types of backhoes and their use and function</p> <p>KB3. Working of engine, transmission, their use and function</p> <p>KB4. Principles of friction</p> <p>KB5. Steering mechanisms and correct way of steering on slopes</p> <p>KB6. Significance of greasing and oiling parts of a backhoe loader that need routine lubrication</p> <p>KB7. Procedure of filling diesel, coolant in the machine</p> <p>KB8. Method of greasing and lubrication</p> <p>KB9. Method to identify the grade and quality of oil to be used</p> <p>KB10. Instrument panel, its location and operation</p> <p>KB11. The various types of hand signals used on the site</p> <p>KB12. Controls, levers and switches in order to operate the backhoe loader appropriately</p> <p>KB13. Optimal working condition of backhoe components</p> <p>KB14. Optimal engine oil pressure, radiator coolant temperature</p> <p>KB15. Visual checks to identify damage, defects, cracks or leaks beforehand</p>
Skills (S)	
<b>A. Core Skills / Generic Skills</b>	<b>Writing Skills</b>
	The user/ individual on the job needs to know and understand how to:
	SA1. Record any deviations/ incidents as per prescribed norms
	<b>Reading Skills</b>
	The user/ individual on the job needs to know and understand how to:
<b>B. Professional Skills</b>	SA2. Read and comprehend basic English to read manuals of operations
	SA3. Read instructions, guidelines/procedures/rules related to the worksite and equipment operations
	<b>Oral Communication (Listening and Speaking Skills)</b>
	The user/ individual on the job needs to know and understand how to:
	SA4. Give clear instructions to co-workers, subordinates and other personnel
	SA5. Use correct technical terms while interacting with supervisor
	<b>Decision Making</b>



**Carry out pre-operation checks for backhoe operations**

	The user/ individual on the job needs to know and understand how to: SB1. Decide when to conduct maintenance checks
	<b>Plan and Organize</b>
	The user/ individual on the job needs to know and understand how to: SB2. Work with supervisors/ team mates to carry out work related tasks SB3. Plan work according to the required schedule and location SB4. Plan for cleaning and lubricating the backhoe loader every day
	<b>Customer Centricity</b>
	The user/ individual on the job needs to know and understand how to: SB5. Provide service of the highest order to ensure customer satisfaction
	<b>Problem Solving</b>
	The user/ individual on the job needs to know and understand how to: SB6. Identify immediate or temporary solutions to resolve mechanical issues SB7. Judge when to seek assistance from supervisor
	<b>Analytical Thinking</b>
	The user/ individual on the job needs to know and understand how to: SB8. Identify cause and effect relations in his area of work
	<b>Critical Thinking</b>
	The user/ individual on the job needs to know and understand how to: SB9. Analyse, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently

**NOS Version Control**

<b>NOS Code</b>	<b>IES/N0101</b>		
<b>Credits(NSQF)</b>	<b>TBD</b>	<b>Version number</b>	<b>1.0</b>
<b>Sector</b>	<b>Infrastructure Equipment</b>	<b>Drafted on</b>	<b>16/02/15</b>
<b>Industry Sub-sector</b>	<b>Equipment Operations</b>	<b>Last reviewed on</b>	<b>31/03/15</b>
<b>Occupation</b>	<b>Operator</b>	<b>Next review date</b>	<b>31/03/15</b>

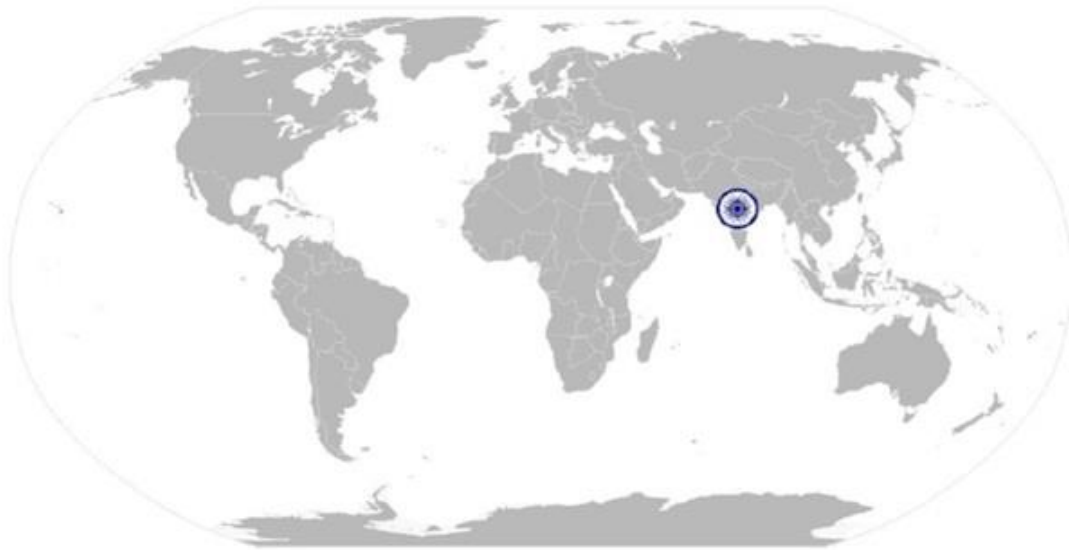
[Back To Top](#)



## Operate a backhoe loader

---

# National Occupational Standard



### Overview

This unit provides Performance Criteria, Knowledge & Understanding and Skills & Ability for activities that are required for operating a backhoe loader.

**Operate a backhoe loader**

<b>Unit Code</b>	<b>IES/N0102</b>
<b>Unit Title (Task)</b>	<b>Operate a backhoe loader</b>
<b>Description</b>	This unit provides Performance Criteria, Knowledge & Understanding and Skills & Ability for activities that are required for operating a backhoe loader.
<b>Scope</b>	This unit/task covers the following: <ul style="list-style-type: none"> <li>• Backhoe start-up operations</li> <li>• Earth digging</li> <li>• Load lifting and dumping</li> <li>• Backhoe shut-down process</li> <li>• Documentation and reporting</li> </ul>
<b>Performance Criteria(PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>
<b>Backhoe start-up operations</b>	To be competent, the user/individual on the job must be able to: PC1. Plan and organize the job according to given instructions PC2. Inspect the worksite to identify and loose soil, hidden deep trenches or marshy patches where a backhoe could get stuck PC3. Prepare worksite ahead of operations in accordance of equipment operations PC4. Carry out all pre-use and running checks PC5. Ensure gear is on neutral position PC6. Wear seatbelt and adjust seat position PC7. Start the engine using the pushbutton switch and key switch together PC8. Use the priming pump and pre-heater to start the engine in cold weather conditions PC9. Select appropriate attachment as per the job requirement PC10. Determine speed and direction of machine, as per the specified function PC11. Use the emergency stop button to disable all power to the backhoe loader in case of a crisis, as per operator manual
<b>Earth digging</b>	PC12. Ascertain the right location to begin operations PC13. Establish weight of load and ensure it is within safe operational limits of the machine PC14. Continually monitor hazards and risks , and ensure safety of self, other personnel, plant and equipment PC15. Drive and operate machine, and modify the operating technique to meet changing work conditions PC16. Effectively use stabilizers to ensure the machinery is completely immobile while digging
<b>Load lifting and dumping</b>	PC17. Select, attach and apply slings and lifting gear in accordance with safe working load requirements PC18. Position and locate machinery to ensure stability to effectively shift materials according to job specifications PC19. Shift load safely and effectively PC20. Move load using hand/audible/communication signals
<b>Backhoe shut-down process</b>	PC21. Turn off ignition after finishing operations PC22. Ensure gear is in neutral position post usage

**Operate a backhoe loader**

	<p>PC23. Idle the equipment for a few minutes post the usage</p> <p>PC24. Remove attachments after use</p> <p>PC25. Ensure attachments are cleaned, removed and stored as per organization's protocol</p> <p>PC26. Ensure that the machine is shut down and secured when left unattended</p>
<b>Documentation and Reporting</b>	<p>PC27. Follow reporting procedures as laid down by the employer</p> <p>PC28. Complete all documentation in the prescribed standards in a timely manner</p> <p>PC29. Report and escalate problems/ incidents as required in a timely manner</p> <p>PC30. Report defects precisely to the supervisor if beyond scope of his role</p>
<b>Knowledge and Understanding (K)</b>	
<b>A. Organizational Context</b> (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. Responsibilities of the assigned job role</p> <p>KA2. Job specific documents e.g. daily maintenance checklist and importance of the same</p> <p>KA3. Common hazards in the work area and workplace procedures to deal with them</p> <p>KA4. Safety policy of the company</p> <p>KA5. Emergency organization of the specific work site</p> <p>KA6. Risk and impact of not following defined procedures/ work instructions</p> <p>KA7. The performance standards &amp; procedures followed in the company</p> <p>KA8. Reporting structure in the company</p> <p>KA9. Escalation matrix for reporting unresolved problems</p> <p>KA10. Timeframe in which the complaint/problem should be resolved</p> <p>KA11. Implications of delays in process to the company</p> <p>KA12. Cost of equipment and loss for the company that result from damage of equipment and direct/ indirect cost of accidents</p> <p>KA13. Work target and review mechanism with supervisor for obtaining/ giving feedback related to performance process</p> <p>KA14. Location of tools</p> <p>KA15. Contact person in case of queries on procedure or products</p> <p>KA16. Location and process for storage and disposal of waste material</p>
<b>B. Technical Knowledge</b>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. Different types of backhoe loaders and their specific use</p> <p>KB2. Working of engine, transmission, their use and function</p> <p>KB3. Principles of friction</p> <p>KB4. Steering mechanisms and correct way of steering on slopes</p> <p>KB5. Significance of greasing and oiling parts of the backhoe</p> <p>KB6. Instruments panel, their location and operation</p> <p>KB7. Controls, levers and switches in order to operate the backhoe properly</p> <p>KB8. Optimal working condition of backhoe loaders</p> <p>KB9. Optimal engine oil pressure, radiator coolant temperature</p> <p>KB10. Significance of stabilizers while digging</p> <p>KB11. The different attachments, their usage and functions (grappler fork, buckets, side shift forks, sweepers, crane hooks, rock breaker etc. )</p>

## Operate a backhoe loader

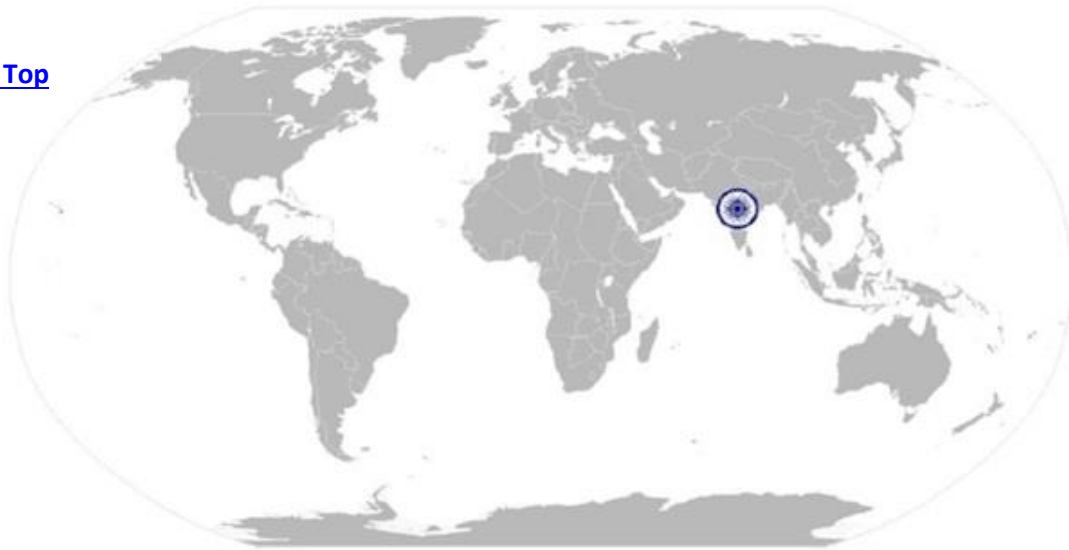
	<p>KB12. Visual checks to identify damage, defects or leaks beforehand</p> <p>KB13. General safety rules for operating a backhoe</p> <p>KB14. All signage, safety signs and other emergency signals</p> <p>KB15. Correct maintenance procedures for backhoe loader</p> <p>KB16. The location and procedure of using the emergency stop button</p>
<b>Skills (S)</b>	
<b>A. Core Skills / Generic Skills</b>	<b>Writing Skills</b>
	The user/ individual on the job needs to know and understand how to:
	SA1. Record any deviations/ incidents as per prescribed norms
	<b>Reading Skills</b>
	The user/ individual on the job needs to know and understand how to:
	SA2. Read and comprehend basic English to read manuals of operations SA3. Interpret stakes and signage on the road and during worksite operations SA4. Read instructions, guidelines/procedures/rules related to the worksite and equipment operations
<b>B. Professional Skills</b>	<b>Oral Communication (Listening and Speaking Skills)</b>
	The user/ individual on the job needs to know and understand how to:
	SA5. Give clear instructions to co-workers, subordinates and other personnel
	SA6. Use correct technical terms while interacting with supervisor
	<b>Decision Making</b>
	The user/ individual on the job needs to know and understand how to:
	SB1. Assess for any damage/faulty component in the backhoe loader and take action accordingly
	SB2. Decide when to perform appropriate driving operations i.e forward, reverse, 'U' turn, tight spot
	<b>Plan and Organize</b>
	The user/ individual on the job needs to know and understand how to:
	SB3. Work with supervisors/ team mates to carry out work related tasks
	SB4. Plan work according to the required schedule and location
	<b>Customer Centricity</b>
	The user/ individual on the job needs to know and understand how to:
	SB5. Provide service of the highest order to ensure customer satisfaction
	<b>Problem Solving</b>
	The user/ individual on the job needs to know and understand how to:
	SB6. Identify immediate or temporary solutions to resolve mechanical issues
	SB7. Judge when to seek assistance from supervisor
	<b>Analytical Thinking</b>
	The user/ individual on the job needs to know and understand how to:
	SB8. Identify possible ways to improve operational efficiency
	SB9. Suggest methods to avoid accidents/errors while operating machine
	<b>Critical Thinking</b>
	The user/ individual on the job needs to know and understand how to:
	SB10. Analyse, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently

## Operate a backhoe loader

### NOS Version Control

NOS Code	IES/N0102		
Credits(NSQF)	TBD	Version number	1.0
Sector	Infrastructure Equipment	Drafted on	16/02/15
Industry Sub-sector	Equipment Operations	Last reviewed on	31/03/15
Occupation	Operator	Next review date	31/03/15

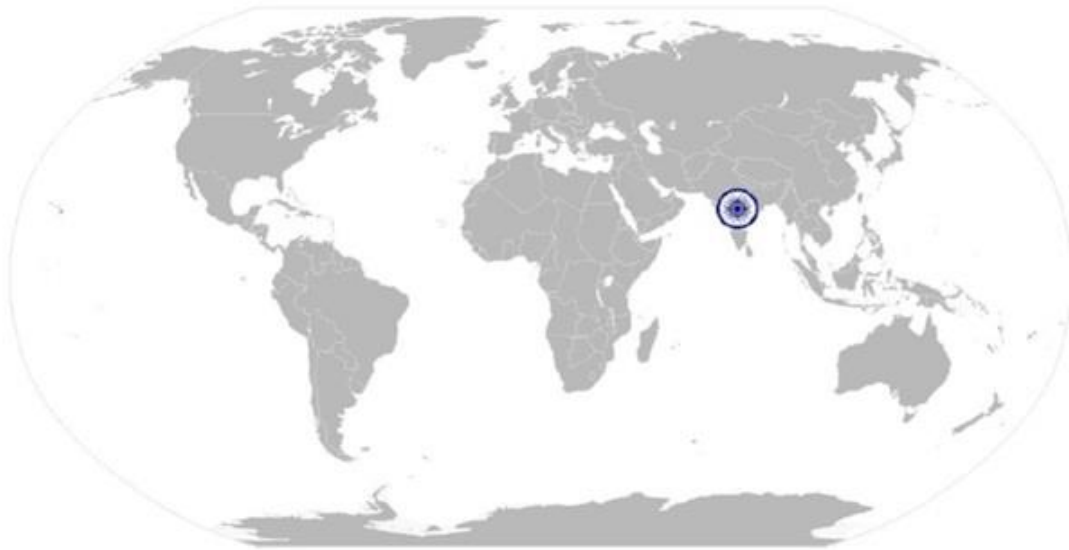
[Back To Top](#)



Carry out maintenance and troubleshooting of the backhoe loader

---

# National Occupational Standard



## Overview

This unit provides Performance Criteria, Knowledge & Understanding and Skills & Ability for activities that are required for performing routine maintenance and troubleshooting on the backhoe loader.

### Carry out maintenance and troubleshooting of the backhoe loader

#### National Occupational Standard

<b>Unit Code</b>	<b>IES/N0103</b>
<b>Unit Title (Task)</b>	<b>Carry out maintenance and troubleshooting of the backhoe loader</b>
<b>Description</b>	This unit provides Performance Criteria, Knowledge & Understanding and Skills & Ability for activities that are required for performing routine maintenance and troubleshooting on the backhoe loader.
<b>Scope</b>	This unit/task covers the following: <ul style="list-style-type: none"> <li>• Routine maintenance</li> <li>• Basic diagnostics and troubleshooting</li> <li>• Documentation and reporting</li> </ul>
<b>Performance Criteria(PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>
<b>Routine maintenance</b>	To be competent, the user/individual on the job must be able to: PC1. Assess the right service schedule by tracking machine operating hours PC2. Clean air filter dust bowls at regular intervals PC3. Clean footplates, pedals and steps free from mud, dirt, ice and snow at regular intervals PC4. Replenish coolants, lubricants and fluids everyday PC5. Grease all greasing pins and pivot points everyday PC6. Check battery levels and condition of the terminals and carry out minor adjustments if required PC7. Check and maintain the tyre rims, air pressure, wheel nits and treads as per manufacturer's indicators
<b>Basic diagnostics and troubleshooting</b>	PC8. Examine the position of the machine to ensure that the machine is on firm and level ground before attempting to carry out any maintenance; track machine operating hours to assess the right service schedule PC9. Complete timely and legibly daily/ weekly maintenance sheets as provided by the company PC10. Inspect the locking bar to ensure that it is in position to prevent the front and rear chassis moving and creating a crushing zone PC11. Ensure that suitable props/ support devices are used and the bucket is not raised while performing maintenance PC12. Ensure that no maintenance task on the engine is performed when running or still hot PC13. Assess when the problem is beyond his competence and report the problem to suitably qualified and competent personnel PC14. Diagnose the problem PC15. Handle and dispose waste based on environmental guidelines at the work place
<b>Documentation and Reporting</b>	PC16. Follow reporting procedures as laid down by the employer PC17. Complete all documentation in the prescribed standards in a timely manner PC18. Report and escalate problems/ incidents as required in a timely manner PC19. Report defects precisely to the supervisor if beyond scope of his role
<b>Knowledge and Understanding (K)</b>	



## Carry out maintenance and troubleshooting of the backhoe loader

<b>A. Organizational Context</b> (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. Job specific documents e.g. daily maintenance checklist and importance of the same</p> <p>KA2. Common hazards in the work area and workplace procedures to deal with them</p> <p>KA3. Safety policy of the company</p> <p>KA4. Emergency organization of the specific work site</p> <p>KA5. Risk and impact of not following defined procedures/ work instructions</p> <p>KA6. The performance standards &amp; procedures followed in the company</p> <p>KA7. Reporting structure in the company</p> <p>KA8. Escalation matrix for reporting unresolved problems</p> <p>KA9. Timeframe in which the complaint/problem should be resolved</p> <p>KA10. Implications of delays in process to the company</p> <p>KA11. Cost of equipment and loss for the company that result from damage of equipment and direct/ indirect cost of accidents</p> <p>KA12. Work target and review mechanism with supervisor for obtaining/ giving feedback related to performance process</p> <p>KA13. Location of tools</p> <p>KA14. Contact person in case of queries on procedure or products</p> <p>KA15. Location and process for storage and disposal of waste material</p>
<b>B. Technical Knowledge</b>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. Responsibilities of the assigned job role</p> <p>KB2. Control and switches needed to operate the backhoe appropriately</p> <p>KB3. Basic physics and mechanics involved in various functions of the backhoe loader</p> <p>KB4. Common defects and general causes of breakdown</p> <p>KB5. Response to emergency situations</p> <p>KB6. The optimal levels of control indicators e.g. fuel gauge, engine oil pressure and temperature</p> <p>KB7. Possible sources of any unusual sound emanating from the engine</p>
<b>Skills (S)</b>	
<b>A. Core Skills / Generic Skills</b>	<b>Writing Skills</b>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. Record any deviations/ incidents as per prescribed norms</p>
	<b>Reading Skills</b>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA2. Read and comprehend basic English to read manuals of operations</p> <p>SA3. Read instructions, guidelines/procedures/rules related to the worksite and equipment operations</p>
	<b>Oral Communication (Listening and Speaking Skills)</b>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA4. Give clear instructions to co-workers, subordinates and other personnel</p> <p>SA5. Use correct technical terms while interacting with supervisor</p>
<b>B. Professional Skills</b>	<b>Decision Making</b> <p>The user/ individual on the job needs to know and understand how to:</p> <p>SB1. Decide when to conduct maintenance checks</p>

**Carry out maintenance and troubleshooting of the backhoe loader**

	SB2. Evaluate the decision and conduct basic trouble shooting
	<b>Plan and Organize</b>
	The user/ individual on the job needs to know and understand how to:
	SB3. Work with supervisors/ team mates to carry out work related tasks
	SB4. Plan work according to the required schedule and location
	SB5. Plan for regular maintenance on a daily basis before machine operations
	<b>Customer Centricity</b>
	The user/ individual on the job needs to know and understand how to:
	SB6. Provide service of the highest order to ensure customer satisfaction
	<b>Problem Solving</b>
	The user/ individual on the job needs to know and understand how to:
	SB7. Identify immediate or temporary solutions to resolve mechanical issues
	SB8. Judge when to seek assistance from supervisor
	<b>Analytical Thinking</b>
	The user/ individual on the job needs to know and understand how to:
	SB9. Identify possible ways to improve operational efficiency
	SB10. Check for damages and diagnose common problems in the backhoe loader and take relevant action
	<b>Critical Thinking</b>
	The user/ individual on the job needs to know and understand how to:
	SB11. Analyse, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently

**NOS Version Control**

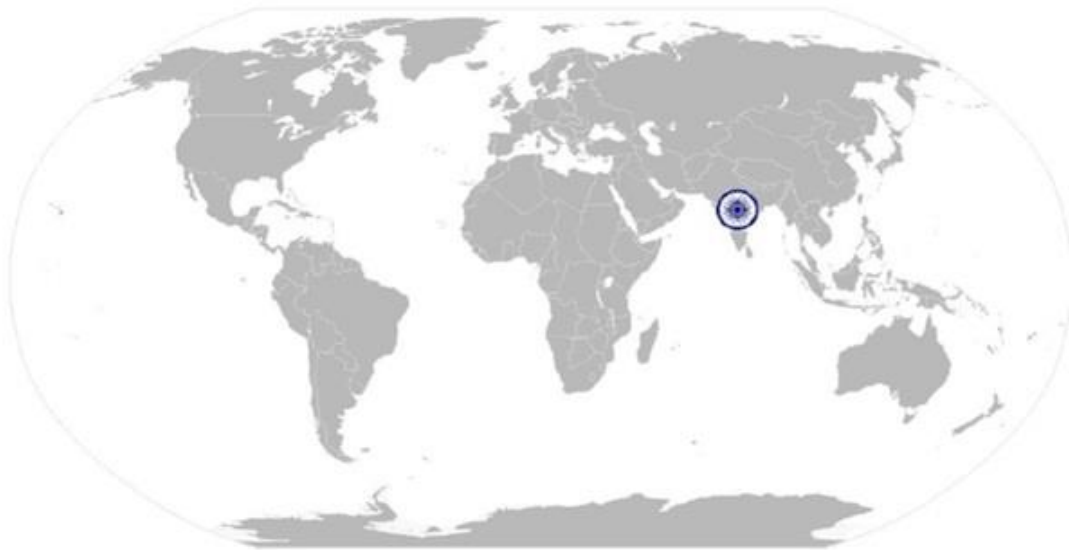
NOS Code	IES/N0103		
Credits(NSQF)	TBD	Version number	1.0
Sector	Infrastructure Equipment	Drafted on	16/02/15
Industry Sub-sector	Equipment Operations	Last reviewed on	31/03/15
Occupation	Operator	Next review date	31/03/15

[Back To Top](#)

Comply with worksite health and safety guidelines

---

# National Occupational Standard



## Overview

This unit is about adhering to health and safety requirements at the worksite during equipment operations.

## Comply with worksite health and safety guidelines

National Occupational Standard	<b>Unit Code</b>	IES/N7601
	<b>Unit Title (Task)</b>	Comply with worksite health and safety guidelines
	<b>Description</b>	This unit is about adhering to health and safety requirements at the worksite during equipment operations.
	<b>Scope</b>	This unit/task covers the following: <ul style="list-style-type: none"> <li>• Worksite health and safety</li> </ul>
	<b>Performance Criteria(PC) w.r.t. the Scope</b>	
	<b>Element</b>	<b>Performance Criteria</b>
	<b>Worksite health and safety</b>	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC1. Comply with safety, health, security and environment related regulations/ guidelines at the work site</p> <p>PC2. Use Personal Protective Equipment (PPE) and other safety gear such as seat belt, body protection, respiratory protection, eye protection, ear protection and hand protection</p> <p>PC3. Follow safety measures during operations to ensure that the health and safety of self or others (including members of the public) is not at risk</p> <p>PC4. Carry out operations as per the manufacturer's and worksite related health and safety guidelines</p> <p>PC5. Handle the transport, storage and disposal of hazardous materials and waste in compliance with worksite health, safety and environmental guidelines</p> <p>PC6. Follow safety regulations and procedures with regard to worksite hazards and risks</p> <p>PC7. Operate various grades of fire extinguishers, as applicable</p> <p>PC8. Support in administering basic first aid and report to concerned team members, as required, in case of an accident</p> <p>PC9. Respond promptly and appropriately to an accident/ incident or emergency situation, within limits of your role and responsibility</p> <p>PC10. Record and report details related to operations, incidents or accidents, as applicable</p>
	<b>Knowledge and Understanding (K)</b>	
	<b>A. Organizational Context</b> (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. Health, safety, environmental(HSE) and security related policies/ guidelines of the organization and the worksite</p> <p>KA2. The importance of complying with health, safety, environmental and security guidelines at the worksite and during operations</p> <p>KA3. Contact details of personnel responsible for Health, Safety and environment (HSE) related matters</p> <p>KA4. Location of worksite storage, SHE team and safe assembly points</p> <p>KA5. Concerned personnel to reach out in case of emergencies and accidents/ incidents</p> <p>KA6. Reporting and documentation procedures for HSE and security matters</p>
	<b>B. Technical Knowledge</b>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. Manufacturer's guidelines related to health and safety requirements</p>

### Comply with worksite health and safety guidelines

	<p>KB2. Common types of health, safety, environment and security risks related to the worksite and operations</p> <p>KB3. Types, use and importance of Personal Protective Equipment (PPE) and other safety gear</p> <p>KB4. Safe working practices to avoid common hazards and risks</p> <p>KB5. Guidelines for transport, storage and disposal of hazardous materials and waste</p> <p>KB6. Types of common hazards and risks at the worksite including fire, electrical, gas emergencies, accidents, incidents, structure collapse, machine breakdown</p> <p>KB7. Knowledge of safe lockdown/ stop of machinery use in case of emergencies and incidents/ accidents</p> <p>KB8. Types of fire extinguishers and their use</p> <p>KB9. Common injuries and appropriate basic first aid treatment eg. electrical shock, bleeding, wounds, fractures, minor burns, eye injuries</p>
<b>Skills (S)</b>	
<b>A. Core Skills / Generic Skills</b>	<b>Writing Skills</b>
	The user/ individual on the job needs to know and understand how to:
	SA1. Document and report any health and safety related incidents/ accidents
	<b>Reading Skills</b>
	The user/ individual on the job needs to know and understand how to:
	SA2. Read and comprehend basic English to read manuals of operations
<b>B. Professional Skills</b>	SA3. Read all organizational and equipment related health and safety manuals and documents
	SA4. Read instructions, guidelines/procedures/rules related to the worksite and equipment operations
	<b>Oral Communication (Listening and Speaking Skills)</b>
	The user/ individual on the job needs to know and understand how to:
	SA5. Give clear instructions to co-workers, subordinates and other personnel
	SA6. Use correct technical terms while interacting with supervisor
	<b>Decision Making</b>
	The user/ individual on the job needs to know and understand how to:
	SB1. Make an appropriate timely decision in responding to emergencies/accidents in line with organizational/ worksite guidelines
	SB2. Use correct PPE and other safety gear while at the worksite
	<b>Plan and Organize</b>
	The user/ individual on the job needs to know and understand how to:
	SB3. Work with supervisors/ team mates to carry out work related tasks
	SB4. Plan work according to the required schedule and location
	<b>Customer Centricity</b>
	The user/ individual on the job needs to know and understand how to:
	SB5. Build and maintain positive and effective relationships with colleagues and customers
	<b>Problem Solving</b>
	The user/ individual on the job needs to know and understand how to:
	SB6. Seek appropriate assistance from other sources to resolve problems

Comply with worksite health and safety guidelines

	<b>Analytical Thinking</b>
	The user/ individual on the job needs to know and understand how to: SB7. Assess the intensity of the fire accident and operate fire extinguishers
	<b>Critical Thinking</b>
	The user/ individual on the job needs to know and understand how to: SB8. Analyse, evaluate and apply the information gathered from observation,experience,reasoning, or communication to act efficiently

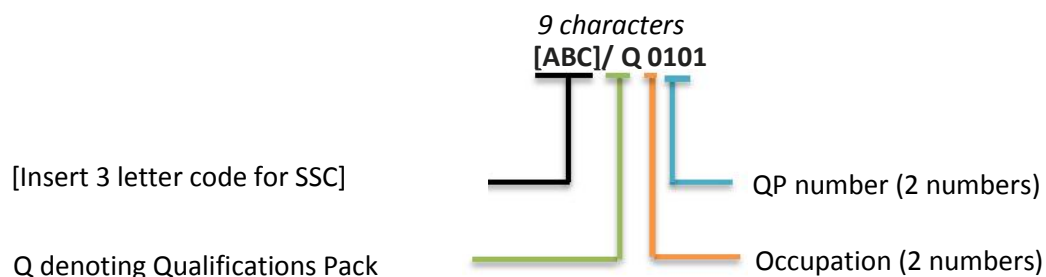
## NOS Version Control

NOS Code	IES/N7601		
Credits(NSQF)	TBD	Version number	1.0
Sector	INFRASTRUCTURE EQUIPMENT	Drafted on	16/02/15
Industry Sub-sector	Equipment Operations	Last reviewed on	31/03/15
Occupation	Operator	Next review date	31/03/15

[Back To Top](#)

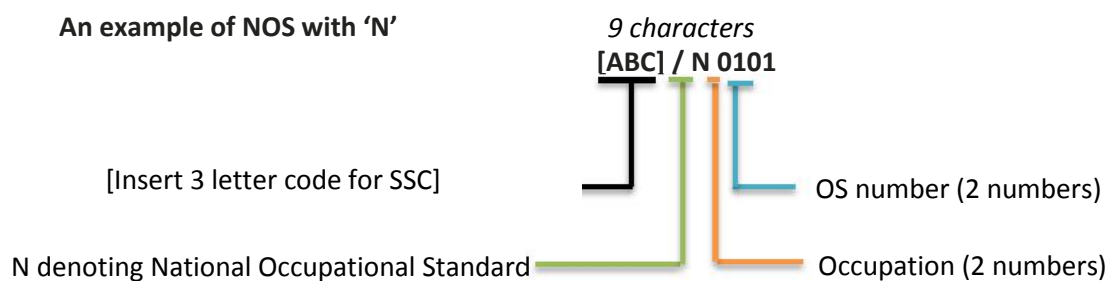
## Nomenclature for QP and NOS units

### Qualifications Pack



### Occupational Standard

An example of NOS with 'N'





## Nomenclature for QP and NOS units

The following acronyms/codes have been used in the nomenclature above:

Sub-sector	Range of Occupation numbers
Equipment Operations	1 to 10
Equipment Service and spares	11 to 20
Equipment Production	21 to 40
Equipment Sales	41 to 50
Equipment Financing	51 to 55
Core Enablers	56 to 65
Other Enablers	66 to 75
Common Occupations	76 to 85

Sequence	Description	Example
Three letters	Industry name	IES
Slash	/	/
Next letter	Whether QP or NOS	N
Next two numbers	Occupation code	01
Next two numbers	OS number	01

## CRITERIA FOR ASSESSMENT OF TRAINEES

**Job Role** Backhoe Loader Operator

**Qualification Pack** IES/Q0101

**Sector Skill Council** Infrastructure Equipment

### Guidelines for Assessment

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC
3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below)
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criteria
5. To pass the Qualification Pack, every trainee should score a minimum of 70% aggregate
6. 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

NOS	PC	Marks Allocation			
		Total Mark	Out Of	Theory	Skills Practical
1. IES/N0101 Carry out pre-checks for backhoe operations	PC1. Examine the backhoe loader body to ensure that the body components are free of cracks and wear	60	3	0	3
	PC2. Confirm that the boom and the stick are without dents and cracked welds		3	0	3
	PC3. Check the differential and hydraulic oil levels to ensure that they are as per manufacturer's indicators		3	0	3
	PC4. Check the hydraulic hose and ram for leakages		3	0	3
	PC5. Conduct checks to ensure proper condition of parking brake, main horn, reverse horn and head light		3	0	3
	PC6. Confirm fan belt tension, electrolyte level and terminal tightness are as per requirement		3	0	3

	PC7. Get visual inspection conducted to check the various controls, gauges, warning lamp and other safety devices		3	0	3
	PC8. Check load chart is displayed in cabin		3	1	2
	PC9. Check and adjust driving position, rear and side mirrors, seat belts and set them as per comfort level		4	1	3
	PC10. Inspect the air filters and check the gasket and inner filter to ensure that the air filter dust bowls are cleaned		3	0	3
	PC11. Drain water and sediment from the fuel tank		2	0	2
	PC12. Check to make sure coolant and oil in engine, transmission, etc. are topped up if necessary as per manufacturer's indicators		4	1	3
	PC13. Inspect the greasing points to ensure that all greasing pins and pivots points are appropriately greased		4	1	3
	PC14. Examine the compressor unit and all fittings and air lines		3	0	3
	PC15. Check clearance of the drawbar ball and socket, look for excessive free-play, and adjust if necessary		3	0	3
	PC16. Ensure the locking bar is in position to prevent the front and rear chassis moving and creating a crushing zone (articulated machines only)		2	0	2
	PC17. Keep footplates and steps clean and free from mud, dirt and oil		3	1	2
	PC18. Certify that the backhoe loader has no one under or on the machine before operating		3	1	2
	PC19. Maintain a checking/maintenance logbook to record all activities performed before starting the backhoe		3	1	2
	PC20. Report defects precisely to the supervisor if beyond scope of his role		2	0	2
		<b>Total</b>	<b>60</b>	<b>7</b>	<b>53</b>
2. IES/N0102 Operate a backhoe loader	PC1. Plan and organize the job according to given instructions		1	0	1

	PC2. Inspect the worksite to identify and loose soil, hidden deep trenches or marshy patches where a backhoe could get stuck	60	2	0	2
	PC3. Prepare worksite ahead of operations in accordance of equipment operations		2	0	2
	PC4. Carry out all pre-use and running checks		2	0	2
	PC5. Ensure gear is on neutral position		2	0	2
	PC6. Wear seatbelt and adjust seat position		2	0	2
	PC7. Start the engine using the pushbutton switch and key switch together		2	0	2
	PC8. Use the priming pump and pre-heater to start the engine in cold weather conditions		3	1	2
	PC9. Select appropriate attachment as per the job requirement		3	1	2
	PC10. Determine speed and direction of machine, as per the specified function		3	1	2
	PC11. Use the emergency stop button to disable all power to the backhoe loader in case of a crisis, as per operator manual		3	1	2
	PC12. Ascertain the right location to begin operations		3	1	2
	PC13. Establish weight of load and ensure it is within safe operational limits of the machine		2	0	2
	PC14. Continually monitor hazards and risks , and ensure safety of self, other personnel, plant and equipment		2	1	1
	PC15. Drive and operate machine, and modify the operating technique to meet changing work conditions		2	0	2
	PC16. Effectively use stabilizers to ensure the machinery is completely immobile while digging		2	0	2
	PC17. Select, attach and apply slings and lifting gear in accordance with safe working load requirements		2	0	2

	PC18. Position and locate machinery to ensure stability to effectively shift materials according to job specifications		2	0	2
	PC19. Shift load safely and effectively		2	0	2
	PC20. Move load using hand/audible/communication signals		2	0	2
	PC21. Turn off ignition after finishing operations		2	0	2
	PC22. Ensure gear is in neutral position post usage		2	0	2
	PC23. Idle the equipment for a few minutes post the usage		1	0	1
	PC24. Remove attachments after use		2	0	2
	PC25. Ensure attachments are cleaned, removed and stored as per organization's protocol		2	0	2
	PC26. Ensure that the machine is shut down and secured when left unattended		2	0	2
	PC27. Follow reporting procedures as laid down by the employer		2	0	2
	PC28. Complete all documentation in the prescribed standards in a timely manner		1	0	1
	PC29. Report and escalate problems/ incidents as required in a timely manner		1	0	1
	PC30. Report defects precisely to the supervisor if beyond scope of his role		1	0	1
		<b>Total</b>	<b>60</b>	<b>6</b>	<b>54</b>
3. IES/N0103Carry out maintenance and troubleshooting on the backhoe loader	PC1. Assess the right service schedule by tracking machine operating hours	<b>50</b>	3	0	3
	PC2. Clean air filter dust bowls at regular intervals		2	0	2
	PC3. Clean footplates, pedals and steps free from mud, dirt, ice and snow at regular intervals		3	1	2
	PC4. Replenish coolants, lubricants and fluids everyday		3	1	2
	PC5. Grease all greasing pins and pivot points everyday		2	0	2

	PC6. Check battery levels and condition of the terminals and carry out minor adjustments if required		2	0	2
	PC7. Check and maintain the tyre rims, air pressure, wheel nits and treads as per manufacturer's indicators		2	0	2
	PC8. Examine the position of the machine to ensure that the machine is on firm and level ground before attempting to carry out any maintenance; track machine operating hours to assess the right service schedule		2	0	2
	PC9. Complete timely and legibly daily/ weekly maintenance sheets as provided by the company		3	1	2
	PC10. Inspect the locking bar to ensure that it is in position to prevent the front and rear chassis moving and creating a crushing zone		2	0	2
	PC11. Ensure that suitable props/ support devices are used and the bucket is not raised while performing maintenance		3	0	3
	PC12. Ensure that no maintenance task on the engine is performed when running or still hot		3	0	3
	PC13. Assess when the problem is beyond his competence and report the problem to suitably qualified and competent personnel		3	1	2
	PC14. Diagnose the problem		3	0	3
	PC15. Handle and dispose waste based on environmental guidelines at the work place		4	1	3
	PC16. Follow reporting procedures as laid down by the employer		3	1	2
	PC17. Complete all documentation in the prescribed standards in a timely manner		3	0	3
	PC18. Report and escalate problems/ incidents as required in a timely manner		2	0	2
	PC19. Report defects precisely to the supervisor if beyond scope of his role		2	0	2

		Total	50	6	44
4. IES/N7601 Comply with worksite health and safety guidelines	PC1. Comply with safety, health, security and environment related regulations/ guidelines at the work site	30	2	0	2
	PC2. Use Personal Protective Equipment (PPE) and other safety gear such as seat belt, body protection, respiratory protection, eye protection, ear protection and hand protection		4	1	3
	PC3. Follow safety measures during operations to ensure that the health and safety of self or others (including members of the public) is not at risk		4	1	3
	PC4. Carry out operations as per the manufacturer's and worksite related health and safety guidelines		3	1	2
	PC5. Handle the transport, storage and disposal of hazardous materials and waste in compliance with worksite health, safety and environmental guidelines		4	1	3
	PC6. Follow safety regulations and procedures with regard to worksite hazards and risks		3	1	2
	PC7. Operate various grades of fire extinguishers, as applicable		3	0	3
	PC8. Support in administering basic first aid and report to concerned team members, as required, in case of an accident		4	1	3
	PC9. Respond promptly and appropriately to an accident/ incident or emergency situation, within limits of your role and responsibility		3	0	3
		Total	30	6	24