



Backhoe Loader

Backhoe Loader Operator

QP Code: MIN/IES/Q0101

Version: 1.0

NSQF Level: 4

Skill Council for Mining Sector || FIMI House, B-311, Okhla Industrial Area, Phase-I
New Delhi-110020

Borrowed Qualification Pack (QP) Parameters



Skill Council For Mining Sector

Qualification Pack



Originating SSC	Infrastructure Equipment
Borrowing SSC	Mining
Borrowing Request Validity	01/09/2016 to 24/09/2021
Assessment and Certification to be conducted by	Mining
Certification Logos to be included	Mining

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MIN/IES/Q0101: Backhoe Loader Operator

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.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. [IES/N0101: Carry out pre-checks for backhoe operations](#)
2. [IES/N0102: Operate a backhoe loader](#)
3. [IES/N0103: Carry out maintenance and troubleshooting of the backhoe loader](#)
4. [IES/N7601: Comply with worksite health and safety guidelines](#)

Qualification Pack (QP) Parameters

Sector	Mining
Sub-Sector	
Occupation	Operator
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2004/8332.22
Minimum Educational Qualification & Experience	8th Class with 2-3 Years of experience In lieu of minimum qualification, the incumbent should have 2 yearsâ€™ experience in driving backhoe loader.

Minimum Level of Education for Training in School	
Pre-Requisite License or Training	1. Certification Training in Backhoe Loader Operations preferred. 2. Must have a valid Heavy Commercial Vehicle Driving License (HCV)
Minimum Job Entry Age	18 Years
Last Reviewed On	31/03/2015
Next Review Date	24/09/2021
Deactivation Date	24/09/2021
NSQC Approval Date	18/06/2015
Version	1.0

IES/N0101: Carry out pre-checks for backhoe operations

Description

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.

Scope

This unit/task covers the following:

- Pre-operation checks
- Documentation and Reporting

Elements and Performance Criteria

Pre - operation Checks

To be competent, the user/individual on the job must be able to:

- PC1.** examine the backhoe loader body to ensure that the body components are free of cracks and wear
- PC2.** confirm that the boom and the stick are without dents and cracked welds
- PC3.** check the differential and hydraulic oil levels to ensure that they are as per manufacturers indicators
- PC4.** check the hydraulic hose and ram for leakages
- PC5.** conduct checks to ensure proper condition of parking brake, main horn, reverse horn and head light
- PC6.** confirm fan belt tension, electrolyte level and terminal tightness are as per requirement
- PC7.** get visual inspection conducted to check the various controls, gauges, warning lamp and other safety devices
- PC8.** check load chart is displayed in cabin
- PC9.** check and adjust driving position, rear and side mirrors, seat belts and set them as per comfort level
- PC10.** inspect the air filters and check the gasket and inner filter to ensure that the air filter dust bowls are cleaned
- PC11.** drain water and sediment from the fuel tank
- PC12.** check to make sure coolant and oil in engine, transmission, etc. are topped up if necessary as per manufacturers indicators
- PC13.** inspect the greasing points to ensure that all greasing pins and pivot points are appropriately greased
- PC14.** examine the compressor unit and all fittings and air lines
- PC15.** check clearance of the drawbar ball and socket, look for excessive freeplay, and adjust if necessary
- PC16.** ensure the locking bar is in position to prevent the front and rear chassis moving and creating a crushing zone (articulated machines only)
- PC17.** keep footplates and steps clean and free from mud, dirt and oil
- PC18.** certify that the backhoe loader has no one under or on the machine before operating

Documentation and Reporting

To be competent, the user/individual on the job must be able to:

- PC19.** maintain a checking/maintenance logbook to record all activities performed before starting the backhoe
- PC20.** report defects precisely to the supervisor if beyond scope of his role

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** the organizations procedures and guidelines related to backhoe loader operations
- KU2.** the performance standards & procedures followed in the company
- KU3.** reporting structure in the company
- KU4.** escalation matrix for reporting unresolved problems
- KU5.** timeframe in which the complaint/problem should be resolved
- KU6.** work target and review mechanism with supervisor for obtaining/ giving feedback related to performance process
- KU7.** location of tools
- KU8.** contact person in case of queries on procedure or products
- KU9.** location and process for storage and disposal of waste material
- KU10.** safety policy of the company
- KU11.** responsibilities of the assigned job role
- KU12.** different types of backhoes and their use and function
- KU13.** working of engine, transmission, their use and function
- KU14.** principles of friction
- KU15.** steering mechanisms and correct way of steering on slopes
- KU16.** significance of greasing and oiling parts of a backhoe loader that need routine lubrication
- KU17.** procedure of filling diesel, coolant in the machine
- KU18.** method of greasing and lubrication
- KU19.** method to identify the grade and quality of oil to be used
- KU20.** instrument panel, its location and operation
- KU21.** the various types of hand signals used on the site
- KU22.** controls, levers and switches in order to operate the backhoe loader appropriately
- KU23.** optimal working condition of backhoe components
- KU24.** optimal engine oil pressure, radiator coolant temperature
- KU25.** visual checks to identify damage, defects, cracks or leaks beforehand

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** record any deviations/ incidents as per prescribed norms
- GS2.** read and comprehend basic english to read manuals of operations

- GS3.** read instructions, guidelines/procedures/rules related to the worksite and equipment operations
- GS4.** give clear instructions to co-workers, subordinates and other personnel
- GS5.** use correct technical terms while interacting with supervisor
- GS6.** decide when to conduct maintenance checks
- GS7.** work with supervisors/ team mates to carry out work related tasks
- GS8.** plan work according to the required schedule and location
- GS9.** plan for cleaning and lubricating the backhoe loader every day
- GS10.** provide service of the highest order to ensure customer satisfaction
- GS11.** identify immediate or temporary solutions to resolve mechanical issues
- GS12.** judge when to seek assistance from supervisor
- GS13.** identify cause and effect relations in his area of work
- GS14.** analyse, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently
- GS15.** record any deviations/ incidents as per prescribed norms
- GS16.** read and comprehend basic english to read manuals of operations
- GS17.** read instructions, guidelines/procedures/rules related to the worksite and equipment operations
- GS18.** give clear instructions to co-workers, subordinates and other personnel
- GS19.** use correct technical terms while interacting with supervisor
- GS20.** decide when to conduct maintenance checks
- GS21.** work with supervisors/ team mates to carry out work related tasks
- GS22.** plan work according to the required schedule and location
- GS23.** plan for cleaning and lubricating the backhoe loader every day
- GS24.** provide service of the highest order to ensure customer satisfaction
- GS25.** identify immediate or temporary solutions to resolve mechanical issues
- GS26.** judge when to seek assistance from supervisor
- GS27.** identify cause and effect relations in his area of work
- GS28.** analyse, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Pre - operation Checks</i>	6	49	-	-
PC1. examine the backhoe loader body to ensure that the body components are free of cracks and wear	-	3	-	-
PC2. confirm that the boom and the stick are without dents and cracked welds	-	3	-	-
PC3. check the differential and hydraulic oil levels to ensure that they are as per manufacturers indicators	-	3	-	-
PC4. check the hydraulic hose and ram for leakages	-	3	-	-
PC5. conduct checks to ensure proper condition of parking brake, main horn, reverse horn and head light	-	3	-	-
PC6. confirm fan belt tension, electrolyte level and terminal tightness are as per requirement	-	3	-	-
PC7. get visual inspection conducted to check the various controls, gauges, warning lamp and other safety devices	-	3	-	-
PC8. check load chart is displayed in cabin	1	2	-	-
PC9. check and adjust driving position, rear and side mirrors, seat belts and set them as per comfort level	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	-	-
PC11. drain water and sediment from the fuel tank	-	2	-	-
PC12. check to make sure coolant and oil in engine, transmission, etc. are topped up if necessary as per manufacturers indicators	1	3	-	-
PC13. inspect the greasing points to ensure that all greasing pins and pivot points are appropriately greased	1	3	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. examine the compressor unit and all fittings and air lines	-	3	-	-
PC15. check clearance of the drawbar ball and socket, look for excessive freeplay, and adjust if necessary	-	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	-	-
PC17. keep footplates and steps clean and free from mud, dirt and oil	1	2	-	-
PC18. certify that the backhoe loader has no one under or on the machine before operating	1	2	-	-
<i>Documentation and Reporting</i>	1	4	-	-
PC19. maintain a checking/maintenance logbook to record all activities performed before starting the backhoe	1	2	-	-
PC20. report defects precisely to the supervisor if beyond scope of his role	-	2	-	-
NOS Total	7	53	-	-

National Occupational Standards (NOS) Parameters

NOS Code	IES/N0101
NOS Name	Carry out pre-checks for backhoe operations
Sector	Infrastructure Equipment
Sub-Sector	Equipment Operations
Occupation	Operator
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	31/03/2015
Next Review Date	31/03/2022
NSQC Clearance Date	18/06/2015

IES/N0102: Operate a backhoe loader

Description

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

Scope

This unit/task covers the following:

Elements and Performance Criteria

Backhoe start-up operations

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 coldweather 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

Earth digging

To be competent, the user/individual on the job must be able to:

- PC12.** ascertain the right location to begin operations
- PC13.** establish weight of load and ensure it is within safe operational limits ofthe 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

Load lifting and dumping

To be competent, the user/individual on the job must be able to:

- PC17.** select, attach and apply slings and lifting gear in accordance with safeworking 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

Backhoe shut-down process

To be competent, the user/individual on the job must be able to:

PC21. turn off ignition after finishing operations

PC22. ensure gear is in neutral position post usage

PC23. idle the equipment for a few minutes post the usage

PC24. remove attachments after use

PC25. ensure attachments are cleaned, removed and stored as per organizations protocol

PC26. ensure that the machine is shut down and secured when left unattended

PC27. follow reporting procedures as laid down by the employer

PC28. complete all documentation in the prescribed standards in a timely manner

PC29. report and escalate problems/ incidents as required in a timely manner

PC30. report defects precisely to the supervisor if beyond scope of his role

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. responsibilities of the assigned job role

KU2. job specific documents e.g. daily maintenance checklist and importance of the same

KU3. common hazards in the work area and workplace procedures to deal with them

KU4. safety policy of the company

KU5. emergency organization of the specific work site

KU6. risk and impact of not following defined procedures/ work instructions

KU7. the performance standards & procedures followed in the company

KU8. reporting structure in the company

KU9. escalation matrix for reporting unresolved problems

KU10. timeframe in which the complaint/problem should be resolved

KU11. implications of delays in process to the company

KU12. cost of equipment and loss for the company that result from damage of equipment and direct/ indirect cost of accidents

KU13. work target and review mechanism with supervisor for obtaining/ giving feedback related to performance process

KU14. location of tools

KU15. contact person in case of queries on procedure or products

KU16. location and process for storage and disposal of waste material

KU17. different types of backhoe loaders and their specific use

KU18. working of engine, transmission, their use and function

KU19. principles of friction

KU20. steering mechanisms and correct way of steering on slopes

KU21. significance of greasing and oiling parts of the backhoe

KU22. instruments panel, their location and operation

- KU23.** controls, levers and switches in order to operate the backhoe properly
- KU24.** optimal working condition of backhoe loaders
- KU25.** optimal engine oil pressure, radiator coolant temperature
- KU26.** significance of stabilizers while digging
- KU27.** the different attachments, their usage and functions (grappler fork, buckets, side shift forks, sweepers, crane hooks, rock breaker etc.)
- KU28.** visual checks to identify damage, defects or leaks beforehand
- KU29.** general safety rules for operating a backhoe
- KU30.** all signage, safety signs and other emergency signals
- KU31.** correct maintenance procedures for backhoe loader
- KU32.** the location and procedure of using the emergency stop button

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** record any deviations/ incidents as per prescribed norms
- GS2.** read and comprehend basic english to read manuals of operations
- GS3.** interpret stakes and signage on the road and during worksite operations
- GS4.** read instructions, guidelines/procedures/rules related to the worksite and equipment operations
- GS5.** give clear instructions to co-workers, subordinates and other personnel
- GS6.** use correct technical terms while interacting with supervisor
- GS7.** assess for any damage/faulty component in the backhoe loader and take action accordingly
- GS8.** decide when to perform appropriate driving operations i.e forward, reverse, 'u' turn, tight spots
- GS9.** plan work according to the required schedule and location
- GS10.** provide service of the highest order to ensure customer satisfaction
- GS11.** identify immediate or temporary solutions to resolve mechanical issues
- GS12.** judge when to seek assistance from supervisor
- GS13.** identify possible ways to improve operational efficiency
- GS14.** suggest methods to avoid accidents/errors while operating machine
- GS15.** analyse, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently
- GS16.** record any deviations/ incidents as per prescribed norms
- GS17.** read and comprehend basic english to read manuals of operations
- GS18.** interpret stakes and signage on the road and during worksite operations
- GS19.** read instructions, guidelines/procedures/rules related to the worksite and equipment operations
- GS20.** give clear instructions to co-workers, subordinates and other personnel
- GS21.** use correct technical terms while interacting with supervisor
- GS22.** assess for any damage/faulty component in the backhoe loader and take action accordingly

- GS23.** decide when to perform appropriate driving operations i.e forward, reverse, 'u' turn, tight spotsb3. work with supervisors/ team mates to carry out work related tasks
- GS24.** plan work according to the required schedule and location
- GS25.** provide service of the highest order to ensure customer satisfaction
- GS26.** identify immediate or temporary solutions to resolve mechanical issues
- GS27.** judge when to seek assistance from supervisor
- GS28.** identify possible ways to improve operational efficiency
- GS29.** suggest methods to avoid accidents/errors while operating machine
- GS30.** analyse, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Backhoe start-up operations</i>	4	21	-	-
PC1. plan and organize the job according to given instructions	-	1	-	-
PC2. inspect the worksite to identify and loose soil, hidden deep trenches or marshy patches where a backhoe could get stuck	-	2	-	-
PC3. prepare worksite ahead of operations in accordance of equipment operations	-	2	-	-
PC4. carry out all pre-use and running checks	-	2	-	-
PC5. ensure gear is on neutral position	-	2	-	-
PC6. wear seatbelt and adjust seat position	-	2	-	-
PC7. start the engine using the pushbutton switch and key switch together	-	2	-	-
PC8. use the priming pump and pre-heater to start the engine in coldweather conditions	1	2	-	-
PC9. select appropriate attachment as per the job requirement	1	2	-	-
PC10. determine speed and direction of machine, as per the specified function	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	1	2	-	-
<i>Earth digging</i>	2	9	-	-
PC12. ascertain the right location to begin operations	1	2	-	-
PC13. establish weight of load and ensure it is within safe operational limits ofthe machine	-	2	-	-
PC14. continually monitor hazards and risks , and ensure safety of self, other personnel, plant and equipment	1	1	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC15. drive and operate machine, and modify the operating technique to meet changing work conditions	-	2	-	-
PC16. effectively use stabilizers to ensure the machinery is completely immobile while digging	-	2	-	-
<i>Load lifting and dumping</i>	-	8	-	-
PC17. select, attach and apply slings and lifting gear in accordance with safeworking load requirements	-	2	-	-
PC18. position and locate machinery to ensure stability to effectively shift materials according to job specifications	-	2	-	-
PC19. shift load safely and effectively	-	2	-	-
PC20. move load using hand/audible/communication signals	-	2	-	-
<i>Backhoe shut-down process</i>	-	16	-	-
PC21. turn off ignition after finishing operations	-	2	-	-
PC22. ensure gear is in neutral position post usage	-	2	-	-
PC23. idle the equipment for a few minutes post the usage	-	1	-	-
PC24. remove attachments after use	-	2	-	-
PC25. ensure attachments are cleaned, removed and stored as per organizations protocol	-	2	-	-
PC26. ensure that the machine is shut down and secured when left unattended	-	2	-	-
PC27. follow reporting procedures as laid down by the employer	-	2	-	-
PC28. complete all documentation in the prescribed standards in a timely manner	-	1	-	-
PC29. report and escalate problems/ incidents as required in a timely manner	-	1	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC30. report defects precisely to the supervisor if beyond scope of his role	-	1	-	-
NOS Total	6	54	-	-

National Occupational Standards (NOS) Parameters

NOS Code	IES/N0102
NOS Name	Operate a backhoe loader
Sector	Infrastructure Equipment
Sub-Sector	Equipment Operations
Occupation	Operator
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	31/03/2015
Next Review Date	31/03/2022
NSQC Clearance Date	18/06/2015

IES/N0103: Carry out maintenance and troubleshooting of the backhoe loader

Description

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.

Scope

This unit/task covers the following:

Elements and Performance Criteria

Routine maintenance

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

Basic diagnostics and troubleshooting

To be competent, the user/individual on the job must be able to:

- 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 suitable props/ support devices are used and the bucket is not raised while performing maintenance
- 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

Documentation and Reporting

To be competent, the user/individual on the job must be able to:

- 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

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. job specific documents e.g. daily maintenance checklist and importance of the same

KU2. common hazards in the work area and workplace procedures to deal with them

KU3. safety policy of the company

KU4. emergency organization of the specific work site

KU5. risk and impact of not following defined procedures/ work instructions

KU6. the performance standards & procedures followed in the company

KU7. reporting structure in the company

KU8. escalation matrix for reporting unresolved problems

KU9. timeframe in which the complaint/problem should be resolved

KU10. implications of delays in process to the company

KU11. cost of equipment and loss for the company that result from damage of equipment and direct/ indirect cost of accidents

KU12. work target and review mechanism with supervisor for obtaining/ giving feedback related to performance process

KU13. location of tools

KU14. contact person in case of queries on procedure or products

KU15. location and process for storage and disposal of waste material

KU16. responsibilities of the assigned job role

KU17. control and switches needed to operate the backhoe appropriately

KU18. basic physics and mechanics involved in various functions of the backhoe loader

KU19. common defects and general causes of breakdown

KU20. response to emergency situations

KU21. the optimal levels of control indicators e.g. fuel gauge, engine oil pressure and temperature

KU22. possible sources of any unusual sound emanating from the engine

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. record any deviations/ incidents as per prescribed norms

GS2. read and comprehend basic English to read manuals of operations

GS3. read instructions, guidelines/procedures/rules related to the worksite and equipment operations

GS4. give clear instructions to co-workers, subordinates and other personnel

GS5. use correct technical terms while interacting with supervisor

GS6. decide when to conduct maintenance checks

- GS7.** evaluate the decision and conduct basic trouble shooting
- GS8.** work with supervisors/ team mates to carry out work related tasks
- GS9.** plan work according to the required schedule and location
- GS10.** plan for regular maintenance on a daily basis before machine operations
- GS11.** provide service of the highest order to ensure customer satisfaction
- GS12.** identify immediate or temporary solutions to resolve mechanical issues
- GS13.** judge when to seek assistance from supervisor
- GS14.** identify possible ways to improve operational efficiency
- GS15.** check for damages and diagnose common problems in the backhoe loader and take relevant action
- GS16.** analyse, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently
- GS17.** record any deviations/ incidents as per prescribed norms
- GS18.** read and comprehend basic english to read manuals of operations
- GS19.** read instructions, guidelines/procedures/rules related to the worksite and equipment operations
- GS20.** give clear instructions to co-workers, subordinates and other personnel
- GS21.** use correct technical terms while interacting with supervisor
- GS22.** decide when to conduct maintenance checks
- GS23.** evaluate the decision and conduct basic trouble shooting
- GS24.** work with supervisors/ team mates to carry out work related tasks
- GS25.** plan work according to the required schedule and location
- GS26.** plan for regular maintenance on a daily basis before machine operations
- GS27.** provide service of the highest order to ensure customer satisfaction
- GS28.** identify immediate or temporary solutions to resolve mechanical issues
- GS29.** judge when to seek assistance from supervisor
- GS30.** identify possible ways to improve operational efficiency
- GS31.** check for damages and diagnose common problems in the backhoe loader and take relevant action
- GS32.** analyse, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Routine maintenance</i>	2	15	-	-
PC1. assess the right service schedule by tracking machine operating hours	-	3	-	-
PC2. clean air filter dust bowls at regular intervals	-	2	-	-
PC3. clean footplates, pedals and steps free from mud, dirt, ice and snow at regular intervals	1	2	-	-
PC4. replenish coolants, lubricants and fluids everyday	1	2	-	-
PC5. grease all greasing pins and pivot points everyday	-	2	-	-
PC6. check battery levels and condition of the terminals and carry out minor adjustments if required	-	2	-	-
PC7. check and maintain the tyre rims, air pressure, wheel nits and treads as per manufacturer's indicators	-	2	-	-
<i>Basic diagnostics and troubleshooting</i>	3	20	-	-
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	-	-
PC9. complete timely and legibly daily/ weekly maintenance sheets as provided by the company	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	-	-
PC11. ensure that suitable props/ support devices are used and the bucket is not raised while performing maintenance	-	3	-	-
PC12. ensure that suitable props/ support devices are used and the bucket is not raised while performing maintenance	-	3	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. assess when the problem is beyond his competence and report the problem to suitably qualified and competent personnel	1	2	-	-
PC14. diagnose the problem	-	3	-	-
PC15. handle and dispose waste based on environmental guidelines at the work place	1	3	-	-
<i>Documentation and Reporting</i>	1	9	-	-
PC16. follow reporting procedures as laid down by the employer	1	2	-	-
PC17. complete all documentation in the prescribed standards in a timely manner	-	3	-	-
PC18. report and escalate problems/ incidents as required in a timely manner	-	2	-	-
PC19. report defects precisely to the supervisor if beyond scope of his role	-	2	-	-
NOS Total	6	44	-	-

National Occupational Standards (NOS) Parameters

NOS Code	IES/N0103
NOS Name	Carry out maintenance and troubleshooting of the backhoe loader
Sector	Infrastructure Equipment
Sub-Sector	Equipment Operations
Occupation	Operator
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	31/03/2015
Next Review Date	31/03/2022
NSQC Clearance Date	18/06/2015

IES/N7601: Comply with worksite health and safety guidelines

Description

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

Scope

This unit/task covers the following:

- Worksite health and safety

Elements and Performance Criteria

Worksite health and safety

To be competent, the user/individual on the job must be able to:

- PC1.** comply with safety, health, security and environment related regulations/ guidelines at the work site
- 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
- 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
- PC4.** carry out operations as per the manufacturers and worksite related health and safety guidelines
- PC5.** handle the transport, storage and disposal of hazardous materials and waste in compliance with worksite health, safety and environmental guidelines
- PC6.** follow safety regulations and procedures with regard to worksite hazards and risks
- PC7.** operate various grades of fire extinguishers, as applicable
- PC8.** support in administering basic first aid and report to concerned team members, as required, in case of an accident
- PC9.** respond promptly and appropriately to an accident/ incident or emergency situation, within limits of your role and responsibility

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** health, safety, environmental (hse) and security related policies/ guidelines of the organization and the worksite
- KU2.** the importance of complying with health, safety, environmental and security guidelines at the worksite and during operations
- KU3.** contact details of personnel responsible for health, safety and environment (hse) related matters
- KU4.** location of worksite storage, site team and safe assembly points
- KU5.** concerned personnel to reach out in case of emergencies and accidents/ incidents
- KU6.** reporting and documentation procedures for hse and security matters

- KU7.** manufacturers guidelines related to health and safety requirements
- KU8.** common types of health, safety, environment and security risks related to the worksite and operations
- KU9.** types, use and importance of personal protective equipment (ppe) and other safety gear
- KU10.** safe working practices to avoid common hazards and risks
- KU11.** guidelines for transport, storage and disposal of hazardous materials and waste
- KU12.** types of common hazards and risks at the worksite including fire, electrical, gas emergencies, accidents, incidents, structure collapse, machine breakdown
- KU13.** knowledge of safe lockdown/ stop of machinery use in case of emergencies and incidents/ accidents
- KU14.** types of fire extinguishers and their use
- KU15.** common injuries and appropriate basic first aid treatment eg. electrical shock, bleeding, wounds, fractures, minor burns, eye injuries

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** document and report any health and safety related incidents/ accidents
- GS2.** read and comprehend basic english to read manuals of operations
- GS3.** read all organizational and equipment related health and safety manuals and documents
- GS4.** read instructions, guidelines/procedures/rules related to the worksite and equipment operations
- GS5.** give clear instructions to co-workers, subordinates and other personnel
- GS6.** use correct technical terms while interacting with supervisor
- GS7.** make an appropriate timely decision in responding to emergencies/accidents in line with organizational/ worksite guidelines
- GS8.** use correct ppe and other safety gear while at the worksite
- GS9.** work with supervisors/ team mates to carry out work related tasks
- GS10.** plan work according to the required schedule and location
- GS11.** build and maintain positive and effective relationships with colleagues and customers
- GS12.** seek appropriate assistance from other sources to resolve problems
- GS13.** assess the intensity of the fire accident and operate fire extinguishers
- GS14.** analyse, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently
- GS15.** document and report any health and safety related incidents/ accidents
- GS16.** read and comprehend basic english to read manuals of operations
- GS17.** read all organizational and equipment related health and safety manuals and documents
- GS18.** read instructions, guidelines/procedures/rules related to the worksite and equipment operations
- GS19.** give clear instructions to co-workers, subordinates and other personnel
- GS20.** use correct technical terms while interacting with supervisor
- GS21.** make an appropriate timely decision in responding to emergencies/accidents in line with organizational/ worksite guidelines

- GS22.** use correct ppe and other safety gear while at the worksite
- GS23.** work with supervisors/ team mates to carry out work related tasks
- GS24.** plan work according to the required schedule and location
- GS25.** build and maintain positive and effective relationships with colleagues and customers
- GS26.** seek appropriate assistance from other sources to resolve problems
- GS27.** assess the intensity of the fire accident and operate fire extinguishers
- GS28.** analyse, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Worksite health and safety</i>	6	24	-	-
PC1. comply with safety, health, security and environment related regulations/ guidelines at the work site	-	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	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	1	3	-	-
PC4. carry out operations as per the manufacturers and worksite related health and safety guidelines	1	2	-	-
PC5. handle the transport, storage and disposal of hazardous materials and waste in compliance with worksite health, safety and environmental guidelines	1	3	-	-
PC6. follow safety regulations and procedures with regard to worksite hazards and risks	1	2	-	-
PC7. operate various grades of fire extinguishers, as applicable	-	3	-	-
PC8. support in administering basic first aid and report to concerned team members, as required, in case of an accident	1	3	-	-
PC9. respond promptly and appropriately to an accident/ incident or emergency situation, within limits of your role and responsibility	-	3	-	-
NOS Total	6	24	-	-

National Occupational Standards (NOS) Parameters

NOS Code	IES/N7601
NOS Name	Comply with worksite health and safety guidelines
Sector	Infrastructure Equipment
Sub-Sector	Equipment Operations
Occupation	Operator
NSQF Level	4
Credits	TBD
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Assessment Guidelines and Assessment Weightage

Assessment Guidelines

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 these criteria.
5. In case of successfully passing only certain number of NOSs, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.
6. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack

Minimum Aggregate Passing % at QP Level : 70

(Please note: Every Trainee should score a minimum aggregate passing percentage as specified above, to

successfully clear the Qualification Pack assessment.)

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
IES/N0101.Carry out pre-checks for backhoe operations	7	53	-	-	60	30
IES/N0102.Operate a backhoe loader	6	54	-	-	60	30
IES/N0103.Carry out maintenance and troubleshooting of the backhoe loader	6	44	-	-	50	25
IES/N7601.Comply with worksite health and safety guidelines	6	24	-	-	30	15
Total	25	175	-	-	200	100

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training

Glossary

Sector	Sector is a conglomeration of different business operations having similar business 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.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
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 (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) 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 (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications 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 verify that this is the appropriate OS they are looking for.
Scope	Scope is a 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 quality of performance required.
Knowledge and Understanding (KU)	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.

Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.