

Training Standard

Tracked Loading Shovel Training (Novice)

Learning outcomes

Including additional guidance to support training delivery and final assessment

The delegate will be able to:

explain the factors that help maintain a safe working environment in the construction industry, and their responsibilities as a loading shovel operator

Delivery to include:

- why the industry has many hazards and why safe working practices must be adopted and maintained
- why personal health and safety is not just physical injury and can include the effects of noise and vibration. All of which can lead to lost time, lost income, expense for the employer, fines, custodial sentences etc.
- Health & Safety at Work Act 1974, Provision and Use of Work Equipment Regulations (PUWER), Management of Health and Safety of Work (MHSW) Regulations, Construction (Design & Management) Regulations (CDM), Vibration at Work Regulations, Road Traffic Act, HSG144, LOLER, HSG47, GS6 etc. in accordance with risk assessments, method statements, codes of practice and other relevant legislation, regulations, and industry good practice
- operators' moral obligations, legal obligations, and environmental obligations
- reporting structures, the importance of good communication on site (colleagues, management, and other workers on site)
- previous incidences involving relevant plant and pedestrians
- working with other related roles e.g., marshallers, banksmen, supervisors, other plant operatives, other occupations, and support workers
- awareness of the limits to their personal knowledge, skills, and experience and when situations exceed these limits the need to stop and seek further advice from supervisors
- understand the risks of "lone working" on plant and machinery

Assessment criteria:

- identify common hazards on a construction site
- explain safe working practices relevant to the role of the loading shovel operator
- explain personal health and safety relevant to the role of the loading shovel operator
- identify aspects of legislation, regulations, and industry good practice relevant to the role of the loading shovel operator
- describe reporting structures and the importance of good communication on site
- explain the role of a banksman in support of loader operations
- explain the responsibilities of a loading shovel operator
- explain practical control measures for those lone working on plant and machinery

identify and extract information from the manufacturers' handbook/operator's manual, and other information sources including digital

Delivery to include:

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- use of the operator's manual (for the specific machine) during the practical elements of training to identify key preparation, operational and safety aspects of the machine
- types of information sources including machine control systems

Assessment criteria:

- identify and extract key elements for the preparation and safe use of the machine using various sources

locate and identify the major components, signs and decals and all controls of the loading shovel and explain their functions

Delivery to include:

- the purpose of principal components, the basic construction, controls, and terminology
- how correct and sympathetic use of the controls can ensure efficiency and safety of the machine and help prolong machine life by reducing wear and tear
- purposes of Roll Over Protection Systems (ROPS) and Falling Objects Protection Systems (FOPS) and other protection systems
- machine control systems – efficiencies, Global Positioning System (GPS)

Assessment criteria:

- identify and explain the function of all controls and warning systems
- explain why the correct and sympathetic use of controls aids efficiency, longevity, and safety
- state the purposes of ROPS and FOPS and other protection systems
- locate and identify the major components, signs, decals, and controls of the machine
- outline the purpose, types and function of machine control systems and electronic aids

conduct all pre-operational checks in accordance with manufacturers and legislative requirements

Delivery to include:

- complete all pre-start and running checks at the start of each shift and at each change of operator, before any activity takes place, including visual checks for damage, functionality, and effectiveness
- checking all componentry systems are fully functional, including mechanical, hydraulic, pneumatic, electrical, and electronic etc.
- replenish fuels, fluids, and lubricants, and undertake grease-based lubrication activities
- manufacturers periodic checks and operator level maintenance requirements
- defect reporting requirements
- carry out routine adjustments
- checking wear rates for wearing components e.g. bucket edges
- ensure correct track adjustment has been achieved and is maintained
- check limits of track adjustment set by manufacturer
- complete all track cleanliness tasks and component serviceability
- track tensioning procedures, limitations and issues where over or under-tensioned
- access to track tensioning equipment/grease nipples.

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- safety systems functions including emergency stop
- health and safety requirements when undertaking basic maintenance activities including Personal Protection Equipment (PPE)
- check condition and function of seatbelt and any other restraining equipment
- check condition and function of any lighting and warning systems including personnel and vehicle detection systems
- requirements for dealing with fluid spills including prevention and clean-up methods

Assessment criteria:

- conduct all pre-operational checks as above in accordance with manufacturer guidance and legislative requirements (note: verbal description to the instructor of specific pre-start checks will be acceptable if the machine is hot where they cannot be done safely e.g., engine fluids) - *this should be observed during practical assessment*
- explain the procedure for defect reporting and why it's important
- explain the procedures to be followed if tracks constantly lose tension
- demonstrate track cleanliness by removing trapped debris from track and chain components
- ascertain cleanliness and serviceability of tracks, rollers and drive sprockets on each side of the equipment
- explain the safety requirements, precautions and dangers of track tensioning and why only to be undertaken by trained operatives/maintenance staff
- describe the principals of how tracks are tensioned and issues that can arise if over or under tensioned

identify and maintain personal protective equipment (PPE) and appropriate safety control equipment for loading shovel use

Delivery to include:

- what safety control equipment/PPE should be worn/used for machine operations and include the following: suitable safety footwear, ear defenders, face/eye protection, dust mask, suitable gloves, overalls, hard hat, respiratory protective equipment (RPE), protective clothing etc.
- appropriate use of local exhaust ventilation (LEV), i.e., in confined spaces
- why weather conditions, including heat and cold, can determine what PPE is worn when using specific machine and the personal effects of incorrect equipment

Assessment criteria:

- describe what forms of PPE and RPE must be worn for site operations
- explain why PPE and RPE must be worn for site operations
- give an example of when use of LEV would be appropriate
- state how severe weather can affect safety and health with insufficient equipment

safely get in to and out of the loading shovel

Delivery to include:

- working at height requirements
- safe use of all hand holds and steps

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- facing the machine when getting in to and out the loading shovel cab for operational and maintenance purposes
- effects of continually getting in to and out of the loading shovel e.g., fatigue, increased risk of falling etc.
- safe areas to get in to/out of the loading shovel e.g., ground location, other vehicle movements etc.
- procedures for accessing the loading shovel when carrying out adjustment and maintenance activities

Assessment criteria:

- explain the effects of not using correct procedures to get in and out of the loading shovel cab including when carrying out adjustment and maintenance activities
- demonstrate the correct procedures as listed above – *this should be observed during practical activities*
- explain the areas for safely getting in and out the loading shovel cab

prepare and configure the loading shovel for site travel

Delivery to include:

- entering and leaving the cab
- use of seatbelts and other restraining equipment
- adjustment of seating position and mirrors
- checks on chassis components, tracks, running gear and loader chassis undercarriage components
- isolation controls
- correct usage of back up alarm
- starting and stopping procedures including cold starting and those for turbochargers
- procedural requirements for exhaust particulate filter cleansing activities
- types of visibility aids and what factors can affect effective vision
- bucket positioning/height and configuration
- where and why effective vision is very important
- what issues can arise where vision is limited during operation, especially during reversing
- procedures if detection system alarms/visual indicators are activated
- the importance of ensuring warning and safety systems are operable
- loading shovel configuration for site travel
- carrying of passengers/non-authorised personnel
- use of steering, braking, and transmission controls

Assessment criteria:

- maintain three points of contact entering and leaving the cab – *this should be observed during practical assessment*
- explain why the use of seatbelts and other restraining equipment should be worn at all times
- explain why the seat should be adjusted for comfort to reduce operator fatigue

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- describe the types and function of isolation systems
- explain the importance of a reversing alarm and the need to maintain permanent connection
- explain the importance of carrying out chassis / track undercarriage based checks
- explain the impact of not following starting and stopping procedures of turbocharged engines
- describe the reasons for exhaust particulate filter cleansing activities
- describe types of visibility aids and what factors can affect effective vision
- explain correct configuration and positioning/height of bucket for appropriate travel mode
- explain where and why effective vision is extremely important, particularly when reversing
- give examples of where poor visibility can arise and the issues this can cause
- explain why the warning, and other safety systems, are important and procedures to be followed if activated
- ensure the seatbelt is worn correctly prior to any machine movement – *this should be observed during practical assessment*
- identify and confirm that functional checks for all warning and safety systems have been carried out – *this should be observed during practical assessment*
- ensure that vision systems are in place, clear, functional and adjusted correctly – *this should be observed during practical assessment*
- conduct all-round visibility checks before moving away – *this should be observed during practical assessment*

travel and manoeuvre the loading shovel safely across varying terrain and inclines

Delivery to include:

- how travel speeds affect loading shovel stability, safety, and emissions
- issues which can occur if departing from designated travel routes and work areas/restricted zones
- types of underground services and the effects of travelling near to/over services
- effects of travelling close to edges, embankments, structures, and trenches
- travelling over various types of terrain
- bucket positioning/height and configuration
- travelling up, down and across inclines
- how certain types of surfaces can affect steering and traction, particularly on inclines
- procedures to be followed for extraction if stuck, including potential safety issues
- how uncompacted surfaces and inclines affect machine stability
- precautions, procedures, and dangers when working on stockpiled materials
- effects due to changes of centre of gravity when on inclines
- machine configuration when travelling on and across steep inclines
- the importance of looking in the direction of travel, particularly when reversing
- precautions and obstructions on travel routes including overhead utilities
- regulative requirements for travelling near to or under overhead power lines

Assessment criteria:

- explain how uncompacted surfaces affect loading shovel stability

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- describe what a stockpile is and why precautions should be taken when travelling and working on them
- explain procedures for working on stockpiles, and non-compacted surfaces, authorisation, and requirements
- explain how and when the centre of gravity alters on a machine and the effects on its stability
- describe how certain types of surfaces can affect steering and traction, particularly on inclines
- state how travel speeds affect loading shovel stability, safety, and emissions
- describe issues which can occur if departing from designated travel routes and work areas/restricted zones
- describe types of underground services and the effects of travelling near to/over services
- explain the effects of travelling close to edges, embankments, structures, and trenches
- demonstrate safe travel over rough, undulating ground, inclines, and level surfaces – *this should be observed during practical assessment*
- explain why boom position/height and centre of gravity is a safety consideration
- demonstrate safe travel speeds in accordance with terrain and environment – *this should be observed during practical assessment*
- face the direction of travel – *this should be observed during practical assessment*
- travel up and down a gradient – *this should be observed during practical assessment*
- stop and start on the gradient whilst travelling uphill – *this should be observed during practical assessment*
- stop and start on the gradient whilst travelling downhill – *this should be observed during practical assessment*
- travel through a chicane which requires left- and right-hand turns, applying the full steering range in both forward and reverse direction - *this should be observed during practical assessment*
- travel over rough, undulating ground, inclines, level surfaces– *this should be observed during practical assessment*
- travel the loading shovel through a restriction in forward and reverse for a minimum distance of 30 meters - *this should be observed during practical assessment*
- maintain full visibility facing direction of travel – *this should be observed during practical assessment*
- avoiding contact with structures and objects - *this should be observed during practical assessment*

Assessment requirements:

- the slope must have an incline of 18% (1:5.5) with sufficient manoeuvring area at the top, or a straight ramp with an up and down route with a flat area at the summit
- the chicane must be a minimum of 30 metres
- when traveling through the chicane and restriction, there must be minimal clearance to ensure accuracy of steering

travel and manoeuvre in areas of restricted space

Delivery to include:

- precautions to be taken when manoeuvring in areas of restricted space

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- use of mirrors and other visual aids and warning systems
- requirements when working alongside highways, railways, and public areas
- height and positioning of the bucket
- how to determine machine size including height, width and working radius relevant to working area
- lighting requirements and issues that may occur due to poor light

Assessment criteria:

- describe typical proximity hazards when in enclosed/restricted areas
- explain the difficulties of being solely reliant on mirrors and advantages of convex type
- explain the factors to consider before entering areas of restricted space
- explain why and how visual aids/detection systems should be observed at all times
- explain the factors to consider when setting up to work next to highways, footpaths, areas of public movement, railways etc.
- explain the purpose and use of movement restrictors
- describe how poor lighting can affect overall safety

explain the safe use, inspection and associated risks of bucket attachment systems including quick-hitch couplers.

Delivery to include:

- types of loading buckets and their intended uses
- principles of bucket installation and removal
- classifications of quick-hitch couplers
- hydraulic pressures
- procedures and sequence of the removal and fitting of attachments using manual and hydraulically operated quick-hitch couplers, including coupling, securing, and checking to ensure safe attachment
- relevant health and safety legislation and legal duties, i.e., LOLER if applicable
- risks associated with quick-hitch couplers, including external intervention/support from others
- visual inspection requirements
- maintenance and storage requirements
- risks of human intervention when changing attachments
- exclusion zone requirements, with all personnel clear of the attachment change area

Assessment criteria:

- identify the classifications of quick-hitch couplers
- outline the dangers of incorrect installation and what information the manufacturers handbook can offer the operator
- describe the required procedures and sequence for removing and fitting attachments using manual and hydraulically operated quick-hitch couplers that ensures safe attachment
- outline the relevant health and safety requirements applicable to the operation of quick-hitch couplers and the legal duties of operators

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- explain why and how hydraulic pressure must be eliminated before disconnecting/connecting hydraulic couplers
- identify the risks associated with attaching attachments using quick-hitch couplers
- describe why an exclusion zone is required for the changing of attachments
- describe why others should not intervene in the changing of attachments
- explain the consequences of incorrect fitment of attachments
- explain the procedures for maintaining quick-hitch couplers
- describe the risks to others if assisting in bucket change activities

conduct all necessary safety checks at the work area

Delivery to include:

- safety checks that must be carried out to ensure the working area is clear of hazards
- communication and relationship requirements and methods with other machine operators, vehicle drivers and support workers
- requirements for sufficient manoeuvring between work areas
- ground conditions for the maintaining of stability
- overhead obstructions and nearby proximity hazards
- awareness of other machines and workers
- restricted, segregation and exclusion zoning requirements
- people/plant interface, procedures, and dangers of allowing others near to a working machine
- danger zones of a working loading shovel
- working in hours of darkness and lighting requirements
- awareness of embankment edges

Assessment criteria:

- explain the need for restricted, exclusion and segregation zones and how they are determined
- describe the safety checks that must be carried out to ensure the loading area is clear of hazards
- describe the types of ground conditions including seasonal that can affect safe operations
- describe the methods of preventing contact with overhead lines
- describe the need for having sufficient manoeuvring space within the work area
- explain the importance of being aware of other machines, vehicles, workers, and segregated walkways
- explain the procedures and dangers of allowing others near to a working machine
- identify the danger zones around the working machine for others
- ensure ground conditions are suitable for loading and maintaining stability – *this should be observed during practical assessment*
- identify any overhead obstructions and nearby proximity hazards – *this should be observed during practical assessment*
- ensure the integrity of restricted zones – *this should be observed during practical assessment*
- explain procedures for working in hours of darkness and lighting requirements

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- identify and use designated loading area entry and exit locations – *this should be observed during practical assessment*
- ensure loading areas are clear of hazards – *this should be observed during practical assessment*
- establish communication methods with supporting workers – *this should be observed during practical assessment*
- explain need for earth berms and/or barriers near embankment edges

configure and set-up for loading duties

Delivery to include:

- required configuration for intended activity
- efficient and safe production methods/cycles of operation
- methods of relaying and interpreting loading work specification
- visual reference points for loading work
- temporary works requirements if working on raised platforms
- where spoil can and should not be placed
- why segregation of materials should be maintained
- positioning of loading shovel and vehicles for loading activities
- selection of the correct bucket/mode to meet work specification

Assessment criteria:

- explain how to establish the working range of the machine
- explain safe sequence of operations for maximum productivity
- describe the types and methods of communication that are used to convey loading and other work criteria to the operator
- outline regulatory requirements for working on temporary, raised platforms
- explain why stockpiled materials are segregated and where they are placed
- position and set up the machine for given loading tasks – *this should be observed during practical assessment*
- describe how automatic levelling of the bucket is an aid to output

explain actions required for hazards, underground and overhead services

Delivery to include:

- regulatory requirements for working near to or under overhead services
- types of services, including buried and surface laid, and the various methods on how they are identified
- emergency and reporting procedures if contact is made with services
- minimum clearances when near to services
- permit to break ground requirements
- protection of services when carrying out loading and extraction activities

Assessment criteria:

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- explain regulative distances that machines should be kept from different types of overhead services
- describe the types of services that may be encountered on site
- explain the emergency and evacuation procedures if contact is made with services on site
- state the minimum distances to be kept from buried and surface laid services
- explain methods and hierarchy of establishing buried services within the work area
- explain how and why contact to services must be reported
- explain why permits to break ground are required, who issues them and on what basis
- explain how and why services should be protected when carrying out loading and extraction activities

extract different types of materials from various stockpiles

Delivery to include:

- typical types of extractions able to be undertaken by a loading shovel
- loading the bucket correctly
- how soil types determine extraction methods
- causes of stockpile instability
- face extraction methods
- how to create an upwards ramp
- method statements, job specifications, risk assessments
- establishing and maintaining visual contact with dedicated supporting workers
- techniques to avoid unnecessary spillage
- maintenance of stockpile area

Assessment criteria:

- describe types and purposes of typical construction-based extractions
- explain the difference between struck and heaped capacities and the reason why bucket should not be overloaded
- explain how extractions should be carried out on differing stockpile types e.g., granular, and cohesive etc.
- explain what methods are used to transfer extraction and loading specifications requirements to the operator
- explain the reason for segregation of different soil types
- explain the importance of maintaining visual contact with dedicated supporting workers
- explain the need for segregation of stockpiled materials, including contaminated types, and procedures for dealing with contamination
- extract a load from a stockpile – *this should be observed during practical assessments*
- form an upwards ramp – *this should be observed during practical assessments*
- explain how the stockpile should be maintained and how to keep a well-drained level working area

place materials into transporting vehicles and hoppers

Delivery to include:

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- types of transporting vehicle and hoppers/bins typically loaded by loading shovels
- visibility requirements for loading purposes including high-sided vehicles, being on raised platforms, and stockpiles
- transporting vehicle positioning for loading and how this varies with type
- communication methods – signals etc.
- manoeuvring area of the loading shovel for loading
- maintaining safety and stability of transporting vehicle during loading
- sequence of loading a vehicle using the loading shovel
- effects of the density/natural fall of a material when loading
- how incorrect loading can cause stability issues for the transporting vehicle
- effects of exceeding the transporting machine manufacturer's limitations when placing loads into a vehicle skip or body
- visibility issues of overloading front-facing skip/body types
- safe positioning of transporting vehicle driver prior to loading
- efficient methods of loading vehicles to capacity
- definition of 'heaped' and 'struck' capacities as stipulated by manufacturer
- ground conditions when loading a vehicle using the loading shovel
- carrying out loading activities to capacity of various transporting vehicle types
- safe transportation of a fully loaded bucket

Assessment criteria:

- state the types of transporting vehicles and hoppers/bins which are typically loaded by loading shovels within construction activities
- explain the issues of maintaining good visibility when loading high-sided vehicles
- state requirements for working on raised platforms and stockpiles and what issues can occur
- describe the considerations for positioning of the loading shovel in relation to various transporting vehicle types for loading activities
- explain the types of communication methods for loading activities
- explain the causes of lateral and longitudinal instability and vision issues of a transporting vehicle when being loaded
- explain why the sequence of loading a vehicle is important
- explain the potential effects (safety, legal and commercial) of overloading and underloading a transporting vehicle
- outline the differences between heaped and struck loads and the effects of having heaped loads on a range of transporting vehicles
- explain the effects of poor ground when loading a vehicle using the front loader
- explain where the driver of the transporting vehicle should be stationed prior to loading on a range of vehicle types
- load material into a transporting vehicle to capacity in accordance with manufacturer's specifications – *this should be observed during practical assessments*
- explain the importance of keeping the bucket (loaded/unloaded) as low as is reasonably practicable

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Assessment requirements:

- the loading vehicle must require at least 3 x loader shovel loads to be filled to the capacity
- the vehicle must be loaded and discharged at least twice

explain environmental considerations of machine use

Delivery to include:

- health and social reasons to reduce machine emissions
- government industry zero emission initiatives relative to this standard
- the environmental impact of different earthmoving equipment engine types and the importance of sustainable practices
- what 'tailpipe' emissions are caused by diesel engines
- air quality and the component gases of air
- how engine emissions, including particulate matter, affect air quality and the effects on human and environmental wellbeing
- measures to reduce emissions during operations including alternative/low emission fuels, fuel treatments and particulate filtration systems etc.
- efficient use of the machine and when and how minimising engine use can aid air quality and fuel savings
- eco-friendly oils, fluids, and lubricants
- fuel-saving techniques for specific item of plant
- appropriate disposal of waste
- spillage procedures

Assessment criteria:

- explain the health and social reasons for reducing machine emissions
- discuss government industry zero emission initiatives relative to this standard
- list two or more effects on human and environmental wellbeing as a result of engine emissions
- explain the environmental impact of different earthmoving equipment engine types and the importance of sustainable practices
- identify measures to reduce emissions on site
- explain appropriate disposal of waste
- explain spillage procedures
- describe the need to keep engine speed and load to a minimum whilst maintaining working efficiency

explain loading/unloading procedures for machine transportation

Delivery to include:

- procedures for preparing the machine for loading onto a transporter
- traction and surface preparation requirements
- understanding of agreed methods of communication between the plant operator and others
- working at height requirements when driving onto or off a transporter bed

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- procedures for tracked loading shovel being craned

Assessment criteria:

- describe the preparation required of both machine and transporter for loading and unloading of the machine
- explain the precautions to be taken when driving the machine onto and off the transporter bed
- state the methods of communication between the plant operator and others
- describe the dangers of and requirements for working at height when on the vehicle bed
- using the operator's manual demonstrate how the equipment should be craned and in particular the recommended slinging positions

carry out all end of work and shut down procedures

Delivery to include:

- types of safe locations, areas, and ground/terrain types where a loading shovel may be parked and should not be parked
- reasons for ensuring safe parking and unintentional movement and ground support requirements
- carrying out parking, shut down and isolation requirements according to manufacturer's instructions
- reasons for machine isolation including security and non-authorised use by others
- use of anti-vandalism equipment

Assessment criteria:

- demonstrate and explain safe parking of the machine - machine is parked in a safe, designated location, clear of hazards on level, firm ground - *this should be observed during practical assessment*
- apply brake systems effectively
- demonstrate how to isolate and secure the tracked loading shovel to prevent non-authorised use and explain why this is important - *this should be observed during practical assessment*
- describe the use of anti-vandalism equipment