

Title	Excavator 180° above 5 Tonnes – Lifting Operations
<p><b>Novice Durations</b></p>	<p><b>Minimum</b>  <b>21 (3 Days) hours including assessment time:</b>                      1 candidate: 1 trainer: 1 machine</p> <p><b>35 (7 Days) hours including assessment time:</b>                      2 candidates: 1 trainer: 1 machine</p> <p><b>49 (7 Days) hours including assessment time:</b>                      3 candidates: 1 trainer: 1 machine</p> <p>The maximum number of candidates is four per group, with a maximum number of two machines per group, all learning outcomes <b>must</b> be covered by each candidate.</p> <p>Trainers must ensure all candidates get equal and sufficient practical engagement time.</p> <p><i>The duration stated in the training standard equals the minimum length of time the course and assessments should take to be completed based on the ratios above. How this is organised is at the discretion of the training provider.</i></p>
<p><b>Experienced Durations</b></p>	<p><b>Minimum</b>  <b>7 (1 Day) hours including assessment time:</b>                      1 candidate: 1 trainer: 1 machine</p> <p><b>14 (2 Days) hours including assessment time:</b>                      2 candidates: 1 trainer: 1 machine</p> <p>Candidates <b>must</b> cover all learning outcomes of the standard in full, the trainer must decide and be able to demonstrate and document their decisions for choosing the candidates route based on their knowledge and skills through a documented profiling approach. Evidence of the profiling and decisions must be kept and made available on request.</p> <p><b>The duration must not be reduced.</b></p>
<p><b>Purpose/ Scope</b></p>	<p>The Purpose and Scope of this standard is to provide the candidate with the skills and knowledge to support the following:</p> <ul style="list-style-type: none"> <li>• Operation of a 180° excavator – to lift, move and place a variety of suspended loads in set configurations</li> <li>• Interpret and comply with legislative certification, specifications, risk assessments and manufacturer’s machine manuals related to the equipment’s ability to undertake lifting operations</li> <li>• Travel with suspended loads</li> <li>• Identify and explain the serviceability, suitability, and application of a range of lifting accessories</li> <li>• Site the machine correctly and safely for lifting operations</li> <li>• Carry out checks, adjust and prepare the machine for lifting operations</li> <li>• Follow given signals and instructions</li> <li>• Understand the capabilities, purposes, and limitations of using the 180° excavator for lifting operations</li> <li>• Comply with all regulative and safety requirements</li> </ul>
<p><b>Occupational Relevance</b></p>	<p>Training delivered against this standard would be relevant to the following occupational group(s):</p> <ul style="list-style-type: none"> <li>• Operative and craft</li> </ul>

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<p><b>Candidates pre-requisites</b></p>	<p><b>Profiling:</b> The trainer will demonstrate and document their decisions for choosing either the Novice or Experienced route based on the candidates knowledge and skills through documented profiling.</p> <p><b>Novice:</b> The candidate does not hold a current industry recognised card within the plant category and/or has limited or no demonstrable practical experience of operating the category of plant in a construction environment. Experience of working on site and a basic knowledge of construction terminology would be beneficial.</p> <p><b>Experienced:</b> The candidate holds a current industry recognised red card within the plant category or has equivalent experience. The trainer must decide and be able to demonstrate a thorough initial assessment and document their decisions for choosing the experienced route based on the candidates knowledge and skills through a documented profiling approach.</p>
<p><b>Trainer Requirements</b></p>	<p>As a minimum, course trainers must be able to demonstrate that, in relation to this standard, they have:</p> <p>Essential:</p> <ul style="list-style-type: none"> <li>• Either             <ul style="list-style-type: none"> <li>a) A current card issued by one of the CSCS partner plant schemes at trainer/trainer/assessor level bearing the category of telescopic handler or</li> <li>b) A current card issued by one of the CSCS partner plant schemes at operator level bearing the category of telescopic handler</li> </ul> </li> <li>• Level 3 Award in Education and Training or equivalent qualification listed in Appendix 3 of the Requirements for Approved Training Organisations</li> <li>• Health and safety qualification at or equivalent to construction site management level such as:             <ul style="list-style-type: none"> <li>– Site Safety Plus Site Management Safety Training Scheme (SMSTS)</li> <li>– Site Safety Plus Site Supervision Safety Training Scheme (SSSTS)</li> <li>– IOSH Managing Safely in Construction</li> <li>– IOSH Safety, Health &amp; Environment for Construction Site Managers</li> <li>– 5-day CISRS Managers course</li> <li>– 5-day CCDO Demolition Managers course and end test</li> <li>– 5-day NPORS Construction Site Safety Manager.</li> </ul> </li> <li>• In addition to the required qualifications, the trainer must be able to demonstrate ‘operational’ experience of operating the telescopic handler relating to the training they are delivering. This can be demonstrated with a minimum of 2 years’ experience.</li> </ul> <p>Desirable:</p> <ul style="list-style-type: none"> <li>• SCQF Level 5/NVQ Level 2 Plant Operations in the specific category being trained</li> <li>• Level 3 Certificate in Assessing Vocational Achievement.</li> </ul>
<p><b>Delivery</b></p>	<p>Training and assessment may be delivered in an on or off-site environment. Where training and assessment takes place within a working construction site environment, training must be segregated from productive work within a prescribed training area, which has been risk assessed and has appropriate control measures in place as required by current legislation and regulations.</p>

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	<p>All equipment required for the training must be set aside specifically for the training session and be available for the entire training duration. Equipment is not to be shared with the working construction site.</p> <p>Welfare facilities must be provided wherever training and assessment takes place, and this should meet relevant legislation.</p> <p>All materials and equipment must be of a suitable quality and quantity for candidates to achieve the learning outcomes delivery and assessment criteria, and must comply with relevant legislation, regulations and industry agreed requirements</p> <p>The class size and candidate/ trainer ratio must allow training to be delivered in a safe manner and enable candidates to achieve the learning outcomes</p> <p>Practical engagement can include seat time, any associated practical checks of the machine e.g. pre-start checks, and observation time</p> <p>Irrespective of the number of candidates, effective learning must be maintained for all candidates.</p> <p>The following training delivery methods may be used in the delivery of this standard:</p> <ul style="list-style-type: none"> <li>• Face to face learning environment (such as a classroom/workshop/site office) for theoretical learning and assessment</li> <li>• On or off the job site environment for practical learning and assessment</li> <li>• Simulator for practical training.</li> </ul> <p><b>Note:</b> if a simulator is used, it can only comprise of a total of 20% of overall practical training and must not be used in any assessment.</p>
<b>Assessment</b>	<p>For the successful completion of training, candidates must complete an end of course practical assessment and knowledge test that has a clear pass or fail criteria as set out by the card scheme. The marking criteria must effectively measure every aspect of each learning outcome and additional guidance for training and assessment.</p> <p>The test used must be the standard CPCS Theory and Practical Test.</p>
<b>Quality Assurance</b>	<p>CPCS will quality assure against this standard and ensure that <b>all</b> Learning Outcomes have been met. The centre must retain evidence that the learning outcomes are referenced and achieved. This must be held by the training centre for a minimum of six years.</p> <p>CPCS will undertake un-announced or announced quality assurance visits of the training to ensure compliance with the Scheme of Works and the requirements of the Tester and Trainer Scheme Booklet.</p> <p>To ensure that compliance checks are effective, NOCN Group Quality Assurance personnel must be given unrestricted access to all activities associated with the delivery of the Training Standards.</p> <p>Further quality assurance requirements are set out in the Test Centre Scheme Booklet.</p>
<b>Approval Date</b>	October 2024
<b>Review Cycle</b>	On request or 5 years from approval date

# Training Standard

## A12C - Excavator 180° above 5 Tonnes – Lifting Operations

<b>Learning outcomes</b> <i>Delivery to include and the candidate will be able to:</i>	<b>Additional guidance to support learning outcome</b> <i>Training Content to contain the following as a minimum:</i>	<b>Assessment Criteria</b>
<b>Lifting planning and lifting operations preparation</b>		
<ul style="list-style-type: none"> <li>• Why all lifts must be planned, supervised, and carried out safely</li> <li>• Competence requirements for those involved in lifting operations</li> <li>• Function of a lift planner, lift plan and typical information that should be detailed in the plan</li> <li>• Type, limitations and extent of information contained within load capacity charts</li> <li>• Extracting information from, and interpreting, lifting/load capacity charts</li> <li>• Load centres/centres of gravity, lifting capacities relevant to reach, height and slew</li> <li>• Methods of establishing the weight of loads, including shape, size, and density</li> <li>• Type of lifting accessories for given types of loads</li> <li>• Machine mode settings for lifting operations</li> <li>• Required boom/dipper configurations for intended activities</li> <li>• Factors that can impact the lateral and longitudinal stability including reach, height, overloading, ground type and compaction, load swing, levelling requirements</li> <li>• How lifting on inclines can affect machine stability</li> <li>• Methods of communication including radio protocol and hand signals for unit loads</li> <li>• Use of stabilisers and other stability aids</li> </ul>	<p>Lift planning and lifting operations preparation:</p> <ul style="list-style-type: none"> <li>• All lifting operations should be planned to ensure that they are carried out safely and that all foreseeable risks have been taken into account</li> </ul> <p>Planning of lifting operations should take into account:</p> <ol style="list-style-type: none"> <li>1. <i>The load, its characteristics and the method of lifting</i></li> <li>2. <i>The selection of suitable lifting equipment</i></li> <li>3. <i>The selection of accessories for lifting/ lifting attachments, the weight to be taken into account</i></li> <li>4. <i>The position of the lifting equipment and of the load before, during and after the operation</i></li> <li>5. <i>The site of the operation including proximity hazards, space availability and suitability of the ground</i></li> <li>6. <i>Any necessary erection and dismantling of the lifting equipment</i></li> <li>7. <i>The environmental conditions that exist or might occur at the site of the operation or the effect of the load on the lifting equipment</i></li> </ol> <p>Risk Assessment:</p> <ol style="list-style-type: none"> <li>1. <i>A risk assessment is carried out by the Appointed Person to identify the hazards associated with the proposed lifting operation.</i></li> <li>2. <i>The assessment should evaluate the risks involved and the nature and extent of any measures required to mitigate the risks</i></li> </ol> <p>Method Statements should include:</p> <ol style="list-style-type: none"> <li>1. <i>The tasks to be achieved</i></li> </ol>	<ul style="list-style-type: none"> <li>• Explain why all lifts should be planned, by whom and factors to be taken into account when lifting activities using excavators are being planned</li> <li>• Explain the type and level of information that would be contained within the manufacturer's issued load/lift capacity chart</li> <li>• Explain why all lifts must be planned, supervised, and carried out safely</li> <li>• Explain the roles involved in lifting operations</li> <li>• Explain why lifting capacities vary according to reach, height, and slew</li> <li>• Explain the methods of establishing weights and centres of gravity</li> <li>• List typical types of lifting accessories used for excavator-related lifting activities</li> <li>• Explain why machine mode settings for lifting operations should be selected at all times</li> <li>• Explain the factors that can impact the lateral and longitudinal stability of the machine</li> <li>• Explain how lifting on inclines and soft ground can affect machine stability</li> <li>• Describe the methods of communication including radio protocol and hand signals that would be used and with whom</li> <li>• Explain how the use of stabilisers and other aids can help stability</li> <li>• Explain why exclusion and segregation zones should be in place before operations commence</li> </ul>

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<ul style="list-style-type: none"> <li>• Rated Capacity Indicators (RCIs) and other types of indicators and warning systems for machine stability</li> <li>• Safety devices-connected with lifting operations</li> <li>• Factors for exclusion and segregation zones</li> <li>• Identification of proximity hazards</li> <li>• Authorised and non-authorised accessory attachment points to the machine</li> <li>• Thorough examinations and other certification requirements</li> <li>• Manufacturers authorisation/approval for the lifting of suspended loads</li> <li>• Why suspended loads cannot be transported using 180° excavators</li> </ul>	<ol style="list-style-type: none"> <li>2. <i>Details of the steps to be taken to eliminate danger to personnel not involved in the lifting operation</i></li> <li>3. <i>The requirement for pre-use checks to be completed</i></li> <li>4. <i>A clear statement of the allocation of tasks to all parties involved in the lifting operation</i></li> </ol> <p>Lifting equipment documentation:</p> <ol style="list-style-type: none"> <li>1. <i>Rated capacity charts</i></li> <li>2. <i>Instruction Manuals</i></li> <li>3. <i>Reports of thorough examination/ test certificates</i></li> </ol> <ul style="list-style-type: none"> <li>• Tool-box Talks to communicate lift plan to all parties</li> <li>• Appointed person – The competent person (lift planner) who has overall responsibility for the lift</li> <li>• Lift supervisor – Supervises the lifting operation on behalf of the Appointed Person (competent person), working to the approved method statement or lift plan. If circumstances require any to the method statement, this must be approved by the Appointed Person (competent person)</li> <li>• Other Signallers – Connects lifting accessories to the load, initiates the lifting by signalling to the operator, observes the path of the load to its destination, signals to the operator and detaches lifting accessories once the load is safely positioned</li> <li>• Equipment operators – Operates the lifting equipment within its permitted duties in accordance with the method statement and as instructed by the signaller and lift supervisor</li> <li>• Lift co-ordinator – The lift co-ordinator should plan and direct the sequence of operations of lifting equipment to ensure that they do not collide with other machines, loads and other equipment</li> </ul>	<ul style="list-style-type: none"> <li>• Explain the importance for the identification of proximity hazards</li> <li>• Explain authorised and non-authorised accessory attachment points</li> <li>• Explain why thorough examinations need to be carried out on the machine and lifting accessories and what is used to confirm that that they have been carried out</li> <li>• Explain the function of the Rated Capacity Indicator (RCI) or, other warning systems for stability</li> <li>• Explain the function of height/slew limits and how they are set up</li> <li>• Explain why suspended loads cannot be transported using 180 excavators</li> </ul>

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	<ul style="list-style-type: none"> <li>• Ancillary workers and other associated occupations – Maintenance personnel should be responsible for maintaining the crane and ensuring its safe and satisfactory operation. They should carry out all necessary maintenance in accordance with the manufacturer’s maintenance manual and within the safe system of work</li> <li>• All lifting operations should be planned to ensure that they are carried out safely and that all foreseeable risks have been taken into account</li> <li>• 180 excavators are not designed for pick and carry duties and such duties must not be carried out:</li> </ul> <p><i>1. Factors to be taken into account by the appointed person include the positioning of the machine, configuration for picking up the load, the position of the backhoe with the 180 working range for picking and placing the load, the amount of slew needed to place the load, and the impact of stability and loads imposed on the stabilisers legs during slew</i></p> <p>Planning of lifting operations should take into account:</p> <ul style="list-style-type: none"> <li>• The load, its characteristics and the method of lifting</li> <li>• The selection of suitable lifting equipment</li> <li>• The selection of accessories for lifting/ lifting attachments, the weight to be taken into account</li> <li>• The position of the lifting equipment and of the load before, during and after the operation</li> <li>• The site of the operation including proximity hazards, space availability and suitability of the ground</li> <li>• Any necessary erection and dismantling of the lifting equipment</li> </ul>	

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	<ul style="list-style-type: none"> <li>• The environmental conditions that exist or might occur at the site of the operation or the effect of the load on the lifting equipment</li> </ul> <p>Risk Assessment:</p> <ul style="list-style-type: none"> <li>• A risk assessment is carried out by the Appointed Person to identify the hazards associated with the proposed lifting operation.</li> <li>• The assessment should evaluate the risks involved and the nature and extent of any measures required to mitigate the risks</li> </ul> <p>Method Statements should include:</p> <ul style="list-style-type: none"> <li>• The tasks to be achieved</li> <li>• Details of the steps to be taken to eliminate danger to personnel not involved in the lifting operation</li> <li>• The requirement for pre-use checks to be completed</li> <li>• A clear statement of the allocation of tasks to all parties involved in the lifting operation</li> </ul> <p>Lifting equipment documentation:</p> <ul style="list-style-type: none"> <li>• Rated capacity charts</li> <li>• Instruction Manuals</li> <li>• Reports of thorough examination/ test certificates</li> <li>• Tool-box Talks to communicate lift plan to all parties</li> </ul> <p>Lifting Accessories:</p> <ul style="list-style-type: none"> <li>• Eyebolts – used for lifting loads, which are usually heavy and concentrated</li> <li>• Lifting and Spreader beams – used to support long or wide loads during lifts, the capacity of the a beam with multiple attachments will be specified</li> <li>• Shackles:               <ol style="list-style-type: none"> <li>1. <i>Bow shackles should be used when one or more attachment is made, or to allow movement on the shackle</i></li> <li>2. <i>Dee shackles are usually joining shackles</i></li> </ol> </li> </ul>	

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	<p><b>3.</b> Only use shackles that are marked with their safe working load</p> <ul style="list-style-type: none"> <li>• Webbing slings:               <ol style="list-style-type: none"> <li>1. Black stitching on webbing slings denotes SWL</li> <li>2. Webbing slings are issued with a statement of conformity confirming Safe Working Load</li> </ol> </li> <li>• Wire rope slings:               <ol style="list-style-type: none"> <li>1. Wire rope slings are available in a wide range of capacities and sizes</li> </ol> </li> <li>• Chain slings:               <ol style="list-style-type: none"> <li>1. Made up of Master Link, Auxiliary Link, Chain, and Hook with safety catch</li> <li>2. Chain sling shorting clutches</li> </ol> </li> <li>• Chain Sling Angles:               <ol style="list-style-type: none"> <li>1. Maximum sling angle 90°</li> <li>2. Chains can be used up to 120° angle if tested for such use</li> </ol> </li> </ul> <p>Lifting equipment:</p> <ul style="list-style-type: none"> <li>• Excavators used for lifting               <ol style="list-style-type: none"> <li>1. Any earthmoving machinery designed for object handling should have a rated object-handling capacity table available inside the cab</li> </ol> </li> <li>• The Working Load Limits (WLL) are the maximum weights which slings are designed to carry in general lifting service according to the standard uniform load method of rating</li> <li>• The load imposed on a sling leg increases as the angle of the leg from vertical increases</li> <li>• Working Load Limits of Chain and Chain Slings have been calculated on the basis of minimum breaking load</li> </ul>	

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	<ul style="list-style-type: none"> <li>• The correct type of sling used in lifting is very important to both operator and the load that is being lifted:               <ol style="list-style-type: none"> <li>1. <i>It is essential that the weight of the load to be lifted is known to a reasonable accuracy</i></li> <li>2. <i>Where the centre of gravity of the load is not known an assessment of the approximate position should be made by the Appointed Person</i></li> <li>3. <i>Only slings and other lifting accessories/ attachments for which a valid report of thorough examination has been issued should be used</i></li> </ol> </li> <li>• All lifting operations should be planned to ensure that they are carried out safely and that all foreseeable risks have been taken into account.</li> <li>• Planning should be carried out by an Appointed Person who has the appropriate knowledge for the lift being undertaken</li> </ul>	
<b>Configure the machine to pick up a range of loads</b>		
<ul style="list-style-type: none"> <li>• The correct use and application of travel controls to include braking controls to position the machine for lifting activities</li> <li>• The importance of maintaining good all-round visibility</li> <li>• The correct use of all hydraulic controls</li> <li>• How attachments and lifting accessories can reduce the stated lifting capacity of the machine</li> <li>• Correct machine configuration for different lifting activities</li> <li>• How the front loader should be set for lifting operations</li> </ul>	<p>Configure the machine to pick up a range of loads</p> <p>The Competent Person must ensure that the planning for each task includes the following:</p> <ul style="list-style-type: none"> <li>• Identifying the task to be undertaken</li> <li>• Selection of appropriate lifting equipment</li> <li>• Identifying the hazards associated with the task</li> <li>• Carrying out a risk assessment</li> <li>• Identifying control measures</li> <li>• Developing the method to be used</li> </ul>	<ul style="list-style-type: none"> <li>• Explain the importance of maintaining good visibility</li> <li>• Explain why front loader positioning is important for lifting operations</li> <li>• Explain how the positioning of the backhoe carriage and use of an extending dipper can severely affect machine stability</li> <li>• Explain why ride-control systems must be disengaged for lifting operations</li> <li>• Explain how the total machine weight including load can affect stability on uncompacted/soft ground</li> </ul>

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<ul style="list-style-type: none"> <li>• How the positioning of the backhoe carriage and use of an extending dipper can severely affect machine stability</li> <li>• Why ride-control systems must be disengaged for lifting operations</li> <li>• Employing stabilisers, lock-out and levelling systems</li> <li>• Checking security/ integrity of load</li> <li>• Checking ground conditions to support the total machine weight including load</li> <li>• Determining the load capability of the machine at various configurations</li> <li>• Prior confirmation on where each load needs to be lifted to and where to be placed</li> <li>• How stabilisers increase stability</li> <li>• Effects of stabilisers on ground pressures and on finished surfaces</li> <li>• Stabiliser sinkage and effects on stability</li> <li>• Positioning of excavator for lifting and placing a range of given loads</li> <li>• How long loads can contact the machine when lifting and slewing</li> <li>• Why the front loaders should not be used for suspended load lifting activities</li> </ul>	<ul style="list-style-type: none"> <li>• Recording the planning in method statement (including any contingency activities for rescue)</li> <li>• Communicating the plan to all persons involved</li> <li>• Reviewing the plan before the tasks starts and incorporating any changing circumstances</li> </ul> <p>Planning lifting operations with 180° excavator:</p> <ul style="list-style-type: none"> <li>• The lifting capacity for a given radius must be known during the planning stage of the lifting operation</li> <li>• Some manufacturers of 180° excavators will only allow lifting duties to be carried out if one or more of the following conditions are complied with: <ul style="list-style-type: none"> <li>• The carriage is central to the machine</li> <li>• The bucket is removed</li> <li>• The extending dipper is locked in the retract position</li> <li>• The dipper ram is fully extended</li> </ul> </li> </ul> <p>Variable positioning Backhoe:</p> <ul style="list-style-type: none"> <li>• The boom and dipper combination of the backhoe is fixed on a kingpost, which itself slews on a carriage</li> <li>• The backhoe can be re-positioned by sliding the carriage to varying positions on both sides of the frame</li> <li>• Stabilisers are located at each end of the frame and should be employed when the backhoe is being used</li> <li>• Lifting suspended loads with the backhoe unit of a 180° excavator requires great care as the risk of instability can be high when the machine is in certain configurations</li> </ul>	<ul style="list-style-type: none"> <li>• Explain why prior confirmation on where each load needs to be lifted to and where to be placed is required</li> <li>• Describe the effects of stabilisers on ground pressures and on finished surfaces</li> <li>• Explain why the lifting of long and/or large area loads requires additional care</li> <li>• Explain why the front loaders should not be used for suspended load lifting activities</li> </ul> <p><b>The following should be observed during the practical assessment:</b></p> <ul style="list-style-type: none"> <li>• Demonstrate the correct use and application of steering, transmission, and braking controls</li> <li>• Demonstrate the correct machine configuration for different load types</li> <li>• Demonstrate correct use of buckets, stabilisers, and levelling systems (if fitted)</li> <li>• Demonstrate the correct use of all hydraulic controls for lifting and travelling activities</li> <li>• Demonstrate the positioning of excavator for lifting and placing a range of given load</li> <li>• Travel to various locations for lifting of pre-set loads</li> <li>• Demonstrate how to configure, set, and prepare the machine to lift a range of applicable loads</li> <li>• Demonstrate that full visibility is maintained during manoeuvring activities</li> </ul>

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	<ul style="list-style-type: none"> <li>• When carrying out lifting and earthmoving operations with the backhoe, the stabilisers become the tipping point of the machine, particularly when working near to or side-on to the machine</li> <li>• Effective stability only occurs when working with the carriage in the centre of the frame and the boom kept within a specified arc (usually 45°) from the centre line of the machine</li> <li>• However, slewing the boom beyond (approximately) 45° of the centre line will proportionally increase the tipping moment and decrease stability</li> <li>• In principle, for maximum stability, lifting operations should only take place when the carriage is central and the arc of the boom kept within a given area – usually 45°</li> </ul> <p>Use of stabilisers:</p> <ul style="list-style-type: none"> <li>• Before lifting operations commence, the stabilisers should be lowered so that the machine's weight is taken off each tyre but with the tyres touching the ground, and the machine levelled by adjusting each leg up or down as required</li> <li>• The front loader bucket provides additional stability and must be lowered to the ground and taking the weight of the front of the machine but with tyres just touching the ground</li> <li>• In some cases, manufacturers will specify that the front bucket is tilted or in the dump position and operators must check what configuration is required for their machine</li> </ul>	<ul style="list-style-type: none"> <li>• Check that ground conditions can support the machine's total weight for the working height and reach</li> <li>• Establish the weight of load and then check against lift/load capacity chart/s for intended height and reach</li> </ul>

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### A12C - Excavator 180° above 5 Tonnes – Lifting Operations

<b>Learning outcomes</b> <i>Delivery to include and the candidate will be able to:</i>	<b>Additional guidance to support learning outcome</b> <i>Training Content to contain the following as a minimum:</i>	<b>Assessment Criteria</b>
	<ul style="list-style-type: none"> <li>• Failure to lower the bucket decreases stability as axle oscillation allows the chassis to rotate on the axle</li> </ul> <p>Machines fitted with ride-control systems:</p> <ul style="list-style-type: none"> <li>• Ride control systems allow a certain level of float within the front loader arms which decreases machine pitch during road or site travel, increasing operator comfort and productivity</li> <li>• The ride control system must be switched off or disabled before the front bucket is lowered for backhoe operations, otherwise the inbuilt float system will allow an upward movement of the front loader, vastly reducing sideways stability</li> </ul> <p>Extending dippers:</p> <ul style="list-style-type: none"> <li>• Many 180° excavators are fitted with an extending dipper on the backhoe. These can cause two additional issues with stability and lifting capacity:</li> <li>• The radius is further increased, decreasing the weight that can be safely lifted</li> <li>• The additional weight of the extending dipper adds to the overall weight to be lifted and further reduces lifting capacity</li> <li>• When consulting manufacturer's specifications for the planning of lifting duties, the correct specifications for the relevant type of dipper must be referred to</li> </ul> <p>Lifting with the front loader:</p> <ul style="list-style-type: none"> <li>• No lifting of suspended loads should take place unless a manufacturer's approved lifting point is available on the front loader, the machine supplied for lifting suspended</li> </ul>	

# Training Standard

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	<p>loads and where the maximum rated lifting capacity is specified</p> <ul style="list-style-type: none"> <li>• Some front buckets may be equipped with one or more eyes that are drilled within, or welded to, the bucket</li> <li>• These are provided for recovery, handling or maintenance purposes and must not be used for lifting duties unless clearly specified as appropriate for lifting duties and are marked by the manufacturer with the maximum lifting capacity</li> <li>• Although forks may be fitted to a multi-purpose front bucket, lifting accessories must not be fitted and used to lift suspended loads from the forks</li> </ul> <p>Lift Categories:</p> <ul style="list-style-type: none"> <li>• Basic Lift</li> <li>• Intermediate Lift</li> <li>• Complex Lift</li> </ul> <p>Selection of lifting accessories:</p> <ul style="list-style-type: none"> <li>• The weight, dimensions, and characteristics of the loader and the loads to be lifted</li> <li>• The operation, speed, radii, height of lift and areas of movement</li> <li>• The number, frequency, and types of lifting operation</li> <li>• The space available for machine access, deployment, operation, and stowage including the space required for correct deployment of stabilisers</li> <li>• The control position which will be most suitable for the lifting operation. The control position should be selected</li> </ul>	

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	<p>to ensure that the operator has an adequate view of the load path is adequately protected from crushing hazards</p> <ul style="list-style-type: none"> <li>• The need for motion limiting devices such as slewing arc or height limiters</li> <li>• The effect of the operating environment on the 180° excavator</li> </ul>	
<b>Lift and place loads accurately and safely at given places</b>		
<ul style="list-style-type: none"> <li>• Quick coupler positioning during lift</li> <li>• Checks on the security/integrity of load</li> <li>• Placing the hook/accessories directly above the centre of gravity of the load</li> <li>• Use of boom locks and king posts</li> <li>• Following given signals and instructions from the slinger/signaller</li> <li>• Maintaining full all-round observation, including with the slinger/signaller</li> <li>• Mode selection for the given activity</li> <li>• Factors and examples that determine where loads can and cannot be placed</li> <li>• Smooth use of all controls</li> <li>• Methods of controlling of load movement/swing and load security including environmental factors</li> <li>• How loads should be guided and controlled</li> <li>• Carrying out trial lifts and the reasons for</li> <li>• Controls isolated/deactivated during accessory attachment and detachment activities</li> <li>• Stabiliser employment for the given activity</li> </ul>	<p>Lift and place loads accurately and safely at given places</p> <p>The Competent Person must ensure that the planning for each task includes the following:</p> <p>Planning lifting operations with 180° Excavators:</p> <ul style="list-style-type: none"> <li>• The lifting capacity for a given radius must be known during the planning stage of the lifting operation</li> <li>• Some manufacturers of 180° excavators will only allow lifting duties to be carried out if one or more of the following conditions are complied with:             <ol style="list-style-type: none"> <li>1. <i>The carriage is central to the machine</i></li> <li>2. <i>The bucket is removed</i></li> <li>3. <i>The extending dipper is locked in the retracted position</i></li> <li>4. <i>The dipper ram is fully extended</i></li> </ol> </li> </ul> <p>Lifting suspended loads:</p> <ul style="list-style-type: none"> <li>• The standard rating of a 180° excavator is for lifting unit loads on the forks; consequently the standard load chart</li> </ul>	<ul style="list-style-type: none"> <li>• Explain why checks on the security/integrity of load are important</li> <li>• Explain why the hook/accessories should be directly above the centre of gravity of the load</li> <li>• Explain the function and application of boom locks and king posts</li> <li>• Explain the identification of and function of check/burst valves</li> <li>• Follow given signals and instructions from the slinger/signaller (demonstration)</li> <li>• Maintaining full all-round observation, including with the slinger/signaller (demonstration)</li> <li>• Mode selection for the given activity (demonstration)</li> <li>• Explain the factors and give examples that determine where loads can and cannot be placed</li> <li>• Smooth use of all controls (demonstration)</li> <li>• Explain what causes load swing/load movement and methods that should be used to control any movement/swing</li> </ul>

# Training Standard

## A12C - Excavator 180° above 5 Tonnes – Lifting Operations

<b>Learning outcomes</b> <i>Delivery to include and the candidate will be able to:</i>	<b>Additional guidance to support learning outcome</b> <i>Training Content to contain the following as a minimum:</i>	<b>Assessment Criteria</b>
<ul style="list-style-type: none"> <li>• Effects on load integrity and security and machine stability when slewing with loads</li> <li>• Effects on stability when slewing beyond 45° degrees to the machine's centre line</li> <li>• How to minimise load swings and the effects of load swing on stability</li> <li>• Lifting and placing loads which may be partially or fully out of sight of the operator</li> <li>• How load shapes, size, weight, length, centre of gravity and securing arrangements affect load security and safe movement of suspended loads</li> <li>• How moisture content within a load can affect stability</li> <li>• How to lift and place a range of loads at various locations where a change of radius (from minimum to maximum) and slewing of up to 180° degrees is required</li> <li>• Identification of and function of check/burst valves</li> <li>• Why suspended loads should not be left unattended</li> </ul>	<p>will not be valid for lifting suspended loads due to different load centres and the effect of any side slope</p> <ul style="list-style-type: none"> <li>• Effective stability only occurs when working with the carriage in the centre of the frame and the boom kept within a specified arc (usually 45°) from the centre line of the machine</li> <li>• However, slewing the boom beyond (approximately) 45° of the centre line will proportionally increase the tipping moment and decrease stability</li> <li>• When working within an arc from about 45° to 90° of the centre line, effective stability only occurs when the carriage is at the furthest point away from the stabiliser leg</li> <li>• In principle, for maximum stability, lifting operations should only take place when the carriage is central and the arc of the boom kept within a given area – usually 45°</li> </ul> <p>Use of stabilisers:</p> <ul style="list-style-type: none"> <li>• The stabilisers should be lowered so that the machine's weight is taken off each tyre but with the tyres touching the ground, and the machine levelled</li> <li>• The front loader bucket provides additional stability and must be lowered to the ground and taking the weight of the front of the machine</li> </ul> <p>Extending dippers:</p> <ul style="list-style-type: none"> <li>• Many 180° excavators are fitted with an extending dipper on the backhoe. These can cause two additional issues with stability and lifting capacity:</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how environmental factors can cause load swing</li> <li>• Explain how loads should be guided and controlled by the slinger/signaller</li> <li>• Explain the reasons for the carrying out of a trial lift</li> <li>• Explain why the controls must be isolated/deactivated during accessory attachment and detachment activities and what dangers could occur if not followed</li> <li>• Stabiliser employment for the given activity (demonstration)</li> <li>• Lifting and placing loads which may be partially or fully out of sight of the operator (demonstration)</li> <li>• Explain how load shapes, size, weight, length, centre of gravity, moisture content and securing arrangements affect load security and safe movement</li> <li>• Explain why the quick coupler should remain in vertical position throughout the lift and why it should not impede on master link and attachment hinge pin</li> <li>• Explain why harsh or incorrect use of hydraulic controls should be avoided</li> <li>• Explain the factors and give examples that determine where loads can and cannot be placed</li> <li>• Explain methods of communication, radio protocol and hand signals for unit loads</li> </ul>

# Training Standard

## A12C - Excavator 180° above 5 Tonnes – Lifting Operations

<b>Learning outcomes</b> <i>Delivery to include and the candidate will be able to:</i>	<b>Additional guidance to support learning outcome</b> <i>Training Content to contain the following as a minimum:</i>	<b>Assessment Criteria</b>
	<ol style="list-style-type: none"> <li>1. <i>The radius is further increased, decreasing the weight that can be safely lifted</i></li> <li>2. <i>The additional weight of the extending dipper adds to the overall weight to be lifted and further reduces lifting capacity</i></li> </ol> <p>Lifting with the front loader:</p> <ul style="list-style-type: none"> <li>• No lifting of suspended loads should take place unless a manufacturer's approved lifting point is available on the front loader</li> </ul> <p>Visibility:</p> <ul style="list-style-type: none"> <li>• The operator's view of the bucket and surrounding area can depend upon the position of the backhoe relative to the centre line of the machine</li> <li>• Slewing the boom/ dipper away from the operator is when the risk is highest due to the lack of full visibility</li> </ul> <p>Slinger/ signaller:</p> <ul style="list-style-type: none"> <li>• The slinger/ signaller should be properly trained in all aspects of slinging loads and signalling, working with excavators, and be authorised by the appointed person</li> <li>• The slinger/ signaller should be responsible for: <ol style="list-style-type: none"> <li>1. <i>Carrying out pre-use and post-use checks of lifting accessories</i></li> <li>2. <i>Attaching and detaching the load to and from the excavator load-lifting attachment</i></li> <li>3. <i>Initiating and directing the safe movement of the excavator using an established and agreed pre-arranged system of communication</i></li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>• Explain why suspended loads should not be left unattended</li> </ul> <p><b>The following should be observed during the practical assessment:</b></p> <ul style="list-style-type: none"> <li>• Lift and place a range of loads at various locations where a change of radius (from minimum to maximum) and slewing of up to 180° degrees is required</li> <li>• Keep within designated travel routes</li> <li>• Demonstrate locking of inner boom once fully retracted and king post in central plane for 180° excavators</li> <li>• Maintain full observation</li> <li>• Demonstrate correct method of controlling a load swing</li> <li>• Demonstrate correct use of stabilisers</li> <li>• Demonstrate use of control isolation devices during attachment/disconnection of loads</li> <li>• Check that loads are appropriately restrained and guided during movement by the load handler</li> <li>• Place all loads accurately at given predetermined points</li> <li>• Follow given signals and instructions</li> <li>• Maintain machine stability and ensure safe parameters are not exceeded on a lift</li> <li>• Demonstrate that during lifting and movement, the load and lifting accessories should always remain freely suspended from the excavator's lift point</li> </ul>

# Training Standard

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<p><b>Learning outcomes</b></p> <p><i>Delivery to include and the candidate will be able to:</i></p>	<p><b>Additional guidance to support learning outcome</b></p> <p><i>Training Content to contain the following as a minimum:</i></p>	<p><b>Assessment Criteria</b></p>
	<p><b>4. Guiding movements of the excavator during pick and carry lifting operations</b></p> <p>Weight of the load to be lifted:</p> <ul style="list-style-type: none"> <li>• The operator of an excavator should always be provided with the accurate weight of the load to be lifted. This can be ascertained from:               <ol style="list-style-type: none"> <li>1. <i>The manufacturer's data plate</i></li> <li>2. <i>Markings on the load</i></li> <li>3. <i>Manufacturer's data sheets or instructions</i></li> <li>4. <i>Drawings</i></li> <li>5. <i>Shipping documents</i></li> <li>6. <i>Weighing the load</i></li> </ol> </li> </ul> <p>Machine operational modes for lifting operations:</p> <ul style="list-style-type: none"> <li>• Some 180° excavators are now fitted with selectable operational modes for a varying number of working activities including lifting operations</li> <li>• Selecting a particular mode adjusts hydraulic oil flow, pressure, control response and circuit priority for specified hydraulic circuits</li> <li>• These settings have been pre-set by the manufacturer and for lifting duties, oil flow is reduced to allow decreased movement speeds of activated components, allowing greater control, which increases accuracy and provides more controlled movements of a load</li> <li>• Where a machine is not fitted with selectable operational modes, the engine speed should be reduced during lifting operations to reduce oil flow</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate that the hydraulics are deactivated when the slinger/signaller is hooking or unhooking the load</li> <li>• Demonstrate that the learner has addressed any foreseeable hazards – this should be confirmed before the practical assessment</li> </ul>

# Training Standard

## A12C Excavator 180° above 5 Tonnes – Lifting Operations

### Additional information about this standard

#### Emphasis to be placed on the following topics:

- Quick-hitch bucket systems - Manufacturer's procedures must be strictly adhered to, Security of bucket to be fully checked (physically) prior to use, Guidance issued by the Health and Safety Executive (HSE), The Construction Plant-hire Association (CPA) and the Off-highway and Plant Equipment Research Centre (OPERC) should be followed and recommended to candidates
- Lifting plans/ methods statements – Lift plans types and requirements and the need for lift planning, adherence to the lift plan as constructed by a competent person
- Hands Off Step Away – Slinger/ Signaller – Identify where it will be safe to be positioned during the lift, especially the first raising of the load (including trial lift), taking into account the potential unexpected load movement that may occur at this stage, understanding the actions to be taken before directing the equipment to first raise the load (including for trial lift), taking hands off the load, stepping away from the load, and moving to a safe space, understanding the actions to take after initial raising of the load, stopping the lift if there is an issue, not intervening in an unexpectedly moving load, waiting for the load to become steady and stable, and only approaching when safe and if necessary

**Note:** The listed training content should not be considered exhaustive and subjects may be added to reflect the individuals' working environment.

To identify a machine within this category, a typical 180° Excavator would normally have the listed features and be used within the described characteristics:

#### Category features:

- Multi-axled wheeled chassis (in most cases) containing central operating position, power, transmission, hydraulic and electrical units
- Front loader arms with removable front loader bucket, all hydraulically operated
- Boom (one-piece) with attached dipper arm and bucket, mounted on a movable (in most cases) carriage, all hydraulically operated
- Machine operating weight of 5 tonnes and above

#### Category characteristics:

- Able to travel in forward and reverse and change direction during travel with most types having all-wheel drive
- Can travel and operate on uneven and loose ground and slopes.
- Carry out excavation and extraction duties in a liner motion using the front or rear buckets within the confines of the operating radius, depth and height.
- Can place materials using a combination of slew and linear motions (rear bucket) or manoeuvring the machine (front bucket) within the confines of the operating radius, depth and height

#### Theory Resource:

- PUWER 1998 Regulations
- LOLER 1998 Regulations
- HSE GS6
- Codes of Practice
- Operator's manual
- Specifications for types of 180° Excavators .
- Site traffic management requirements
- Industry Guidance.

### Measure of this training standard

The candidate is required to pass the following tests:

#### CPCS Theory Test: Excavator 180° - Lifting Operations:

- Course Trainers can use the published CPCS Theory Questions during training to confirm that the candidate is able to demonstrate the required knowledge understanding and retention to undertake the CPCS Standard Technical Theory Test.

#### CPCS Practical Test: Excavator 180° - Lifting Operations:

# Training Standard

## A12C Excavator 180° above 5 Tonnes – Lifting Operations



- Course Trainers can use the published CPCS Practical Test criteria during training to confirm that the candidate is able to demonstrate the required practical ability and understanding to undertake the CPCS Standard Technical Practical Test.
- **Note** - Course Trainers can find the current versions of the CPCS Technical Test Theory Questions and CPCS Technical Practical Test NOCN Group website and are subject to review, ensure you are using the most current version as printed versions are uncontrolled.