Course Objectives Excavator 180° below 5 tonnes Lifting Operations (experienced)

It is envisaged that by the end of this course of training the learner will be able to answer questions on and perform the following:

- Lift planning and lifting operations preparation
- Configure the machine to pick up a range of loads
- Lift and place loads accurately and safely at given places

Learning Outcomes for Excavator 180° below 5 tonnes Lifting Operations (experienced)

Learning Outcome	Instructor Notes
Lift planning and lifting operations preparation	***Delivery to include:*** • Why all lifts must be planned, supervised, and carried out safely • Competence requirements for those involved in lifting operations • Function of a lift planner, lift plan and typical information that should be detailed in the plan • Type, limitations and extent of information contained within load capacity charts • Extracting information from, and interpreting, lifting/load capacity charts • Load centres/centres of gravity, lifting capacities relevant to reach, height and slew • Methods of establishing the weight of loads, including shape, size, and density • Type of lifting accessories for given types of loads • Machine mode settings for lifting operations • Required boom/dipper configurations for intended activities • Factors that can impact the lateral and longitudinal stability including reach, height, overloading, ground type and compaction, load swing, levelling requirements • How lifting on inclines can affect machine stability • Methods of communication including radio protocol and hand signals for unit loads • Use of stabilisers and other stability aids • Rated Capacity Indicators (RCIs) and other types of indicators and warning systems for machine stability • Safety devices connected with lifting operations • Factors for exclusion and segregation zones • Identification of proximity hazards • Authorised and non-authorised accessory attachment points to the machine • Thorough examinations and other certification requirements • Manufacturers authorisation/approval for the lifting of suspended loads • Why suspended loads cannot be transported using 180° excavators

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Configure the machine to pick up a range of loads	***Delivery to include:*** • The correct use and application of travel controls to include braking controls to position the machine for lifting activities • The importance of maintaining good all-round visibility • The correct use of all hydraulic controls • How attachments and lifting accessories can reduce the stated lifting capacity of the machine • Correct machine configuration for different lifting activities • How the front loader should be set for lifting operations • How the positioning of the backhoe carriage and use of an extending dipper can severely affect machine stability • Why ride-control systems must be disengaged for lifting operations • Employing stabilisers, lock-outs and levelling systems • Checking security/integrity of load • Checking ground conditions to support the total machine weight including load • Determining the load capability of the machine at various configurations • Prior confirmation on where each load needs to be lifted to and where to be placed • How stabilisers increase stability • Effects of stabilisers on ground pressures and on finished surfaces • Stabiliser sinkage and effects on stability • Positioning of excavator for lifting and placing a range of given loads • How long loads can contact the machine when lifting and slewing • Why the front loaders should not be used for suspended load lifting activities
Lift and place loads accurately and safely at given places	• quick coupler positioning during lift • checks on the security/integrity of load • placing the hook/accessories directly above the centre of gravity of the load

- use of boom and king post locks
- following given signals and instructions from the slinger/signaller
- maintaining full all-round observation, including with the slinger/signaller
- mode selection for the given activity
- factors and examples that determine where loads can and cannot be placed
- smooth use of all controls
- methods of controlling of load movement/swing and load security including environmental factors
- how loads should be guided and controlled
- carrying out trial lifts and the reasons for
- controls isolated/deactivated during accessory attachment and detachment activities
- stabiliser employment for the given activity
- effects on load integrity and security and machine stability when slewing with loads
- effects on stability when slewing beyond 45 degrees to the machine's centre line
- how to minimise load swings and the effects of load swing on stability
- lifting and placing loads which may be partially or fully out of sight of the operator
- how load shapes, size, weight, length, centre of gravity and securing arrangements affect load security and safe movement of suspended loads
- how moisture content within a load can affect stability
- 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
- identification of and function of check/burst valves
- why suspended loads should not be left unattended

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The learning outcomes listed should not be considered in isolation and may be added to in order to accurately reflect the learner's duties and working environment