



# Excavators in tree work



## Introduction

This leaflet covers the safe working practices to be followed when operating tracked 360° excavators and walking excavators in forestry and other tree work. For guidance on specific operations involving excavator base units see AFAG leaflets 204 *Flails and mulchers in tree work*, 504 *Extraction by cable crane*, 603 *Mechanical harvesting*, and 605 *Mechanical roadside processing*.

You can use this leaflet, along with the manufacturer's handbook, as part of the risk assessment process to help identify the controls to put in place when operating excavators in the forest.

You must also assess the effect of the site conditions and the weather as well as following this guidance.

All operators must have had appropriate training in how to operate the machine\* and how to carry out the tasks required (see AFAG leaflet 805 *Training and certification*).

## Personal protective equipment (PPE)

- 1 Use the following PPE:
  - Safety helmet (complying with EN 397) when the risk assessment identifies that it is needed.
  - Suitable hearing protection (complying with EN 352) where the noise level exceeds 80 dB(A) (see INDG363 *Protect your hearing or lose it!*).
  - Suitable protective gloves when handling materials such as fuel, ropes or chemicals.
  - Protective boots with good grip and ankle support (complying with EN ISO 20345).
  - Non-sag outer clothing appropriate to the prevailing weather conditions.
  - High-visibility clothing (complying with EN 471) should be worn when the risk assessment identifies that it is needed.
- 2 A suitable first-aid kit, including a large wound dressing, should be available in the base vehicle (see HSE leaflet INDG214 *First aid at work: Your questions answered*).
- 3 Hand-cleaning material such as waterless skin cleanser or soap, water and paper towels should be readily available.
- 4 You should have available and know how to use an emergency kit for spills of fuel, oil or chemicals.

\* A relevant NPTC Forest Machine Operator Certificate Scheme (FMOCS) qualification should be obtained for the type of excavator work being undertaken.

## General

- ❑ 5 All risk zones specified by the machine manufacturer must be clearly and prominently marked on all machines. This will normally be twice the maximum reach of the boom. In addition the risk zone may need to be increased depending on the attachment being used (eg harvesting operations or debris ejected from flails etc).
- ❑ 6 A sign warning against working in the vicinity of overhead electric power lines must be prominently displayed in all machines, together with the maximum height of the machine and the maximum height in the recommended (non-operational) travelling position.
- ❑ 7 When the machine is used in a lifting operation the Lifting Operations and Lifting Equipment Regulations 1998 (LOLER) will apply. In some cases (eg cable crane operations or lowering culvert pipes) the excavator may need to have a current certificate of thorough examination in accordance with the Regulations (see HSE Information sheet AIS29 *LOLER: How the Regulations apply to forestry*).
- ❑ 8 The machine operator is at particular risk from falls during on-site maintenance and refuelling operations. Ensure suitable means of access and safe working positions have been established.

## The machine

- ❑ 9 Before work starts, an assessment should be carried out to identify the suitability of the machine in relation to the site and the task to be undertaken.
- ❑ 10 The features of the machine to be considered should include:
  - stability and floatation – track length and width;
  - traction – grouser height and frequency;
  - ground clearance – raised undercarriage;
  - machine guarding – to prevent damage to pipework/components during the operation;
  - poor light conditions – adequate lighting must be fitted.
- ❑ 11 The risk assessment should identify what levels of operator protection are required on the machine. Consider:
  - operator protective structures (OPS) – in the form of guarding (eg bars/mesh/polycarbonate glazing), to prevent harvesting residues etc entering the cab;
  - falling object protective structures (FOPS) – in the form of a frame/deflectors surrounding the cab to prevent falling objects striking and entering the cab;
  - roll-over protective structures (ROPS) – where there is a risk of the machine overturning.

## Preparing to work

- ❑ 12 Ensure information has been provided about all worksite hazards identified in the risk assessment, and the control measures are fully understood.
- ❑ 13 Check the worksite for underground and overhead hazards and services, eg electricity cables, phone lines, water and gas mains. Where present, ensure they are clearly marked and provide suitable crossing points if necessary.
- ❑ 14 Many excavator operations involve working in isolation. This must be addressed as part of the site risk assessment and an agreed lone-working procedure followed, eg a call-in or buddy system.
- ❑ 15 Select routes that are within the machine's and driver's capabilities.
- ❑ 16 When using walking excavators also consider:
  - identifying suitable access and egress points before work starts;
  - identifying potential obstructions and hazards, eg harvesting residue that may need treatment before work starts;
  - identifying any shallow soil, loose ground surfaces or large obstacles that can affect machine stability;
  - assessing and controlling the risk of objects being disturbed by the walking excavator and rolling downhill onto any work/access routes/footpaths etc below the worksite.

## Emergency procedures

- ❑ 17 Ensure a designated and responsible person knows the daily work programme and agree with them a suitable emergency contact procedure. Where reasonably practicable, use a mobile phone or radio and a pre-arranged call-in system.
- ❑ 18 Ensure the operators can provide the emergency services with enough detail for them to be found if there is an accident, eg the grid reference, distance from the main road, type of access (suitable for car/four-wheel-drive/emergency service vehicles). Know the location details before they are needed in an emergency (also see AFAG leaflet 802 *Emergency planning*).

## Operating

- ❑ 19 Carry out pre-start checks in accordance with the manufacturer's handbook. Ensure safety guards and attachments are securely fixed in position.
- ❑ 20 Use the steps and handholds provided to enter and leave the machine.
- ❑ 21 Ensure nobody is in the immediate vicinity when the equipment is started.

- ❑ **22** Before operating the travel levers, ensure you know in which direction the machine is pointing.
- ❑ **23** Use extreme caution when reversing or slewing. Be sure there is a clear path around the machine.
- ❑ **24** Keep any attachment as close as possible to the ground.
- ❑ **25** Do not operate the machine if any part of it, or its load, can come within 15 m of overhead electric power lines unless it has been established that the line voltage does not exceed 33 kV, in which case this distance may be reduced to 9 m (see AFAG leaflet 804 *Electricity at work: Forestry and arboriculture*). A different approach to safety distances is required during extraction by cable crane, mechanical harvesting or mechanical roadside processing (see relevant AFAG leaflets).
- ❑ **26** When using walking excavators, ensure the wheels and legs are set as wide as possible to maintain stability. The cab should be kept as level as possible.
- ❑ **27** Be aware that the weather conditions may affect the machine-handling characteristics.
- ❑ **28** Be aware of the limitations of the machine on slopes, soft ground and other major obstacles.
- ❑ **29** Wherever possible, localised obstacles such as harvesting residue, stumps, rocks etc should be moved or avoided to allow safe operation and travel. On steep ground do not allow this material to roll where it may be hazardous to anyone below.
- ❑ **30** If the machine begins to slide or becomes unstable, lower the attachment onto the ground as quickly as possible.
- ❑ **31** Do not attempt to jump clear of an overturning machine – sit tight and stop the engine.

### Parking the machine

- ❑ **32** Before leaving the operator's seat:
  - lower all implements and attachments to a safe position;
  - check you have locked out all control systems;
  - shut down the engine and remove the keys.

### Machine maintenance

- ❑ **33** Ensure maintenance is carried out by a competent person, in accordance with the manufacturer's handbook, and meets the requirements of the Provision and Use of Work Equipment Regulations 1998.
- ❑ **34** Choose a level site with good footing.
- ❑ **35** Check the machine has fully stopped and the ignition key has been removed. If appropriate, isolate the electrical system.

- ❑ **36** Secure all parts that could move or fall.
- ❑ **37** Use only the appropriate tools and techniques.
- ❑ **38** Where bolts have to be replaced they must be replaced by the same grade and type of bolt.
- ❑ **39** Do not use your hand to check for hydraulic fuel leaks – use a piece of paper or cardboard. Hydraulic fluid under pressure can penetrate the skin. If such contamination occurs seek medical attention at once.
- ❑ **40** No procedure should be attempted for which the operator has not been trained.
- ❑ **41** Where there is a risk of falling from the machine, take appropriate measures to ensure operator safety. This can include the use of fall-arrest systems where appropriate.
- ❑ **42** Do not attempt to operate a double-acting ram that has a broken pipe. Use other controls to lower the boom to a safe position and release the load if required.
- ❑ **43** Ensure all hydraulic pressure in the systems to be maintained or repaired is released before work starts. Where this is not possible, ease the residual pressure by careful slackening of joints.
- ❑ **44** Always use two spanners to refit a pipe or hose to avoid twisting the hose.
- ❑ **45** Keep a maintenance record.

### Machine transport

- ❑ **46** Know the machine's width, height, length and weight and ensure the transport vehicle is suitable.
- ❑ **47** Make sure the trailer is parked on firm, level ground before loading or unloading.
- ❑ **48** When loading and unloading the machine, travel at the slowest speed possible. The ramp surface should be clean and free of mud, grease etc which may cause the machine to slide.
- ❑ **49** If slewing is necessary when the machine is on the trailer, do this as slowly as possible, making sure other people are at a safe distance.
- ❑ **50** Engage the slew lock and secure the machine to the trailer.

## Notes

## Further reading

<i>Flails and mulchers in tree work</i>	AFAG204
<i>Extraction by cable crane</i>	AFAG504
<i>Mechanical harvesting</i>	AFAG603
<i>Mechanical roadside processing</i>	AFAG605
<i>Emergency planning</i>	AFAG802
<i>Electricity at work: Forestry and arboriculture</i>	AFAG804
<i>Training and certification</i>	AFAG805
<i>PUWER 98: How the Regulations apply to agriculture and forestry</i>	AIS27
<i>LOLER: How the Regulations apply to forestry</i>	AIS29
<i>First aid at work: Your questions answered</i>	INDG214
<i>Managing health and safety in forestry</i>	INDG294
<i>Protect your hearing or lose it!</i>	INDG363
<i>Managing public safety on harvesting sites</i>	01 7176 2671 7

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## Notes

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## Further information

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**This leaflet contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.**

This leaflet is available in priced packs of 15 from HSE Books, ISBN 0 7176 2629 6. Single free copies are also available from HSE Books.

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