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ISIS practice
For BT People

EPT/OHP/B034

Issue 18, 10-Feb-2021
Use until 10-Feb-2022

Published by Technical Documentation - Openreach

Privacy- Internal

Mechanised Poling Operations

About this document ...

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Content approval

This is the Issue 18 of this document.
The information contained in this document was approved on 10-Feb-2021 by Glen Barford, Overhead Network Policy and Standards Specialist

Version History

Version No.	Date	Author	Comments
Issue 18	10-Feb-2021	Wesley Grantham	Author/Approver update
Issue 17	09-Dec-2019	ISIS co-ordinator Network Engineer's Office	No content change – review date extended
Issue 17	07-Dec-2016	ISIS co-ordinator .	Change of approver
Issue 16	20-Dec-2015	ISIS co-ordinator .	Add new Appendix Sec 12.2
Issue 15	15-Jul-2015	ISIS co-ordinator .	Inclusion of Red zone/green zone works process for vicinity to HV power lines
Issue 14	03-Mar-2015	Document Manager T	Document migrated onto new platform with no content change
Issue 14	5-Aug-2014	ISIS co-ordinator .	References amended - HSC/COP/A001 and 002 removed. Section 10 updated. (AT336)
Issue 13	15-Oct-2013	ISIS co-ordinator .	Dig location practices for stays updated. AEC/B133 content merged (AT263)
Issue 12	30-Jul-2013	Chief Engineer's Office Technical Documentation team	Removal of obsolete references and inclusion of new checklist process for carrying pre-dressed poles
Issue 11	5-Oct-2010	Chief Engineer's Office Technical Documentation team	Document reviewed.New Para. 1.3.2.1 (Integration EM 5-2009)Revised Para. 1.3.3 (Integration EM 5-2009)Revised Para. 2.6 (Integration EM 5-2009)(DCC1002PD)
Issue 10	25-Jul-2010	Chief Engineer's Office Technical Documentation team	Document reviewed.Change of author.Para. 1.3.3 revised to include ISIS EPT/PPS/B046 reference. (DCC837PD)
Issue 9	26-Feb-2010	Chief Engineer AEI Technical Documentation Team	Document reviewed.Para 8 revised. (DCC600)
Issue 8	9-Feb-2009	Chief Engineer AEI Technical Documentation Team	Incorporation of ESM 31/2007
Issue 7	30-Dec-2008	Chief Engineer AEI Technical Documentation Team	Inclusion of new section on leaning poles and change of author & approver
Issue 6	7-Jan-2008	Paul Downes	Revisions to Para. 1.2, 1.3.1, 2.5, 4, 4.1, 4.3.
Issue 5	9-Jan-2007	Paul Downes	Change of author. Para 4.3.2 Tensioner 3A replaced by Tensioner 3B
Issue 4	3-Mar-2006	John Pearson	Updated
Issue 3	16-Jan-2006	John Pearson	Updated
Issue 2	12-Mar-2004	J Pearson	Minor revisions -strapping

			and carrying poles and safe digging

Table of Content

1 *Introduction*

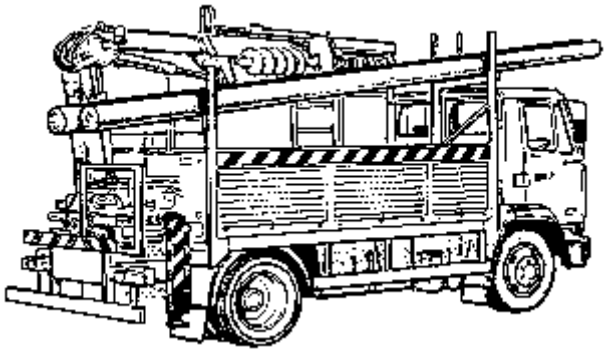


Figure 1 Lightweight Pole Erection Unit

1.1 Scope

These instructions cover the practices to be adopted when erecting and recovering poles using vehicles fitted with cranes.

There are many types of vehicle used for mechanised poling operations and the exact procedure to be followed may differ slightly for each particular vehicle. Vehicles specifically covered by this document are Traditional Pole Erection Units (PEUs), Stores Carriers with and without winches and newer Lightweight PEUs based on lorry mounted cranes and equipped with augers.

Because individual units may differ one from another these instructions contain statements such as "if fitted". Look out for these and act appropriately. If there is any doubt as to the practices to be followed for a particular unit, consult your manager.

These instructions supersede all previous documentation on mechanised poling including External Engineering Memos (and their predecessors, for example NSET Memos) prior to the date of issue of this document.

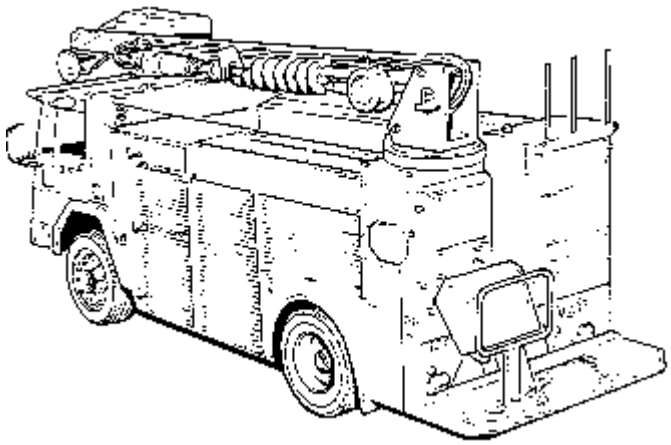


Figure 2 "Traditional" Pole Erection Unit

Note: Drawings may omit detail such as pole steps and pole lashings for clarity.

1.2 Training

Any persons operating or assisting in the operation of poling units must have been trained in the appropriate practices. Both the unit operator and the pole/auger handler should have been trained to carry out their respective tasks and should be aware of the physical and operational constraints on the other person. Where there is any practice carried out not covered by these instructions, then that practice should conform with other existing documented and trained practices.

Operator and pole handlers should ensure that they know and understand the signals they are going to use.

Before any work is carried out, it is the operators' and their manager's responsibility to ensure the operators know and are trained on the type of vehicle they are using and to ensure that they are familiar with all controls and safety precautions applicable to the vehicle.

Any person involved in the operation of poling units and their Manager must be fully compliant to ISIS SFY/HSH/C008 - Risk Assessment Policy and ISIS SFY/NNS/V300 – Job Risk Assessment and Licensing.

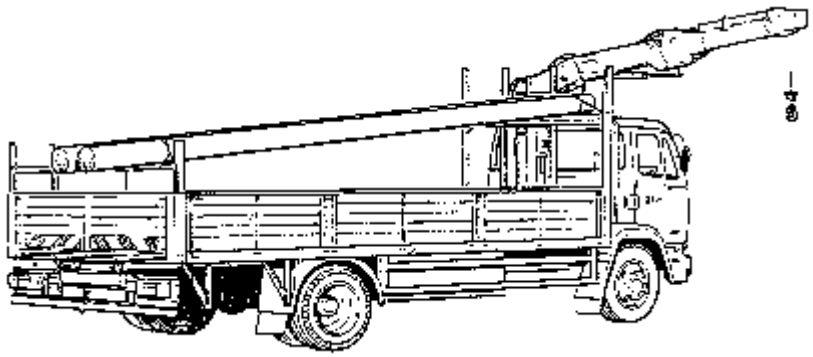


Figure 3 Stores Carrier Type Poling Unit

1.3 Safety

These safety notes are for you, your colleagues and the public's safety - please read them.

1.3.1 Other instructions

Staff operating these units should have access to and knowledge of the relevant parts of the following:

- Vehicle and Crane Operators Handbooks for the particular unit
- ISIS SFY/HSH/D057 Safe Digging and Location of Buried Services
- Street works & Road works a code of practise
- ISIS MTT/VHE/E001 Drivers Handbook and any other requirements and guides for vehicle driving and operation
- ISIS EPT/OHP/B033 Poling Handbook
- ISIS EPT/OHP/B058 Poles, Planning Information
- ISIS EPT/OHP/C022 Pole Examination and Testing
- ISIS EPT/PPS/B046 Work on Overhead BT Lines in the Vicinity of Power Lines
- ISIS SFY/HSH/C008 - Risk Assessment Policy
- ISIS SFY/NNS/V300 Job Risk Assessment & Licensing
- Appropriate sections of the Health & Safety Handbook
- Other appropriate ISIS documents.
- See also section 10 (refereences)

1.3.2 Safety Checks

Ensure you or an appropriate person carry out the appropriate daily and weekly checks on:

- Crane - See BES/LLE/A030
- Lifting Gear - As above
- Emergency Stops and Slew Limitation - See the vehicle and crane manuals
- Pole Lashing Equipment and Lashing Points - Must be treated as Tools and checked accordingly
- Hydraulic hoses

If any slew limitation system fails its test then, if allowed by the manufacturer's handbook, the unit may continue to be used as if no slew limitation system was fitted (that is, both steady legs must be fully deployed).

Ensure you report any defects.

Before use each day ensure that all control levers operate freely and that, where these are designed to return to the off position, they do so.

1.3.2.1 Safe Digging – Mandatory Risk Assessment

Front end Risk Assessment

Before any work on Pole or Stay Anchor Installation begins, an On Site Risk Assessment **MUST** be undertaken to ascertain the likelihood of other Utilities Plant being encountered.

The Risk Assessment (shown below) is **MANDATORY** and must be undertaken by the Operations Team on site.

Note: For additional information on safe digging. See ISIS SFY/HSH/D057 (Safe Digging and Location of Buried Services).

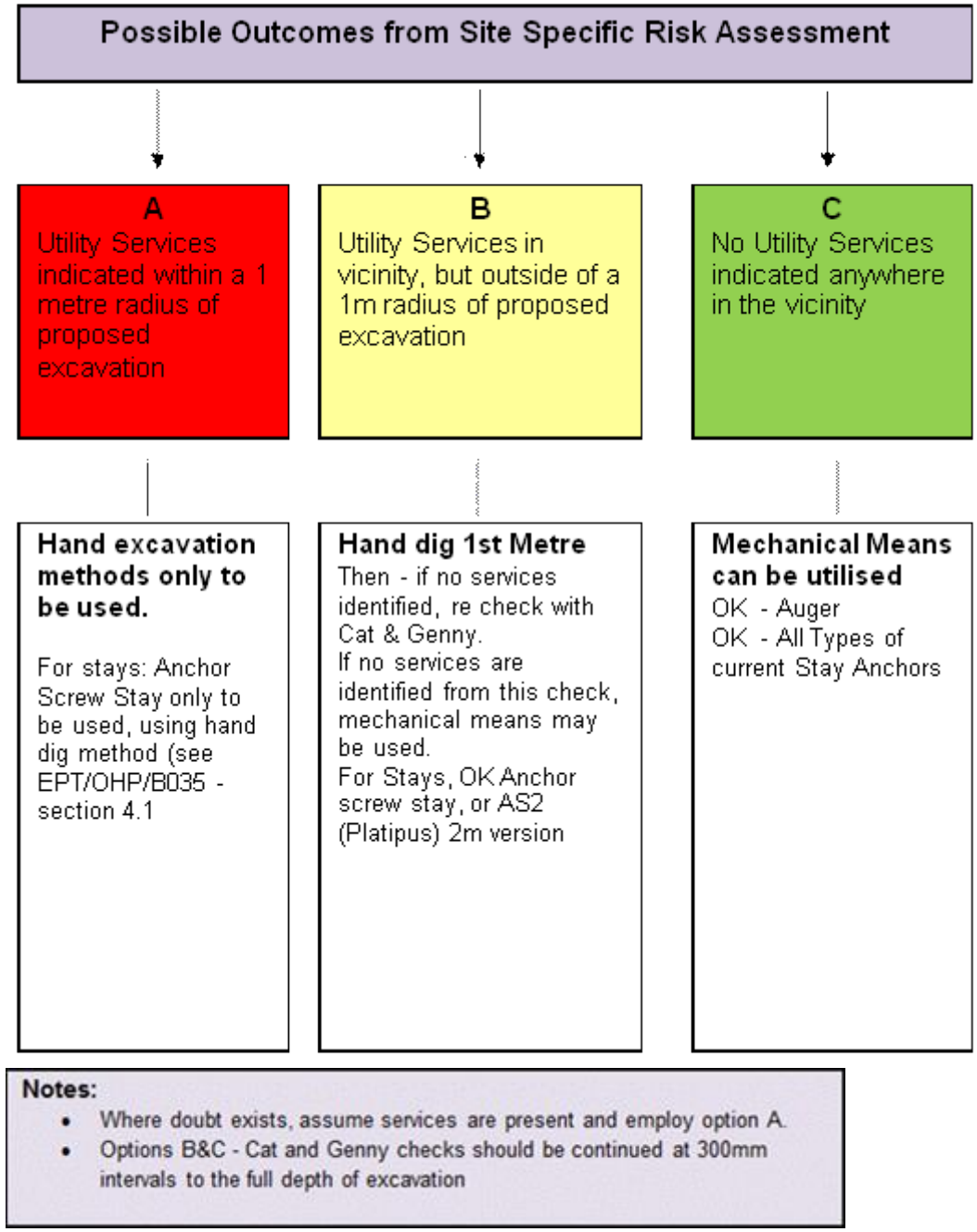
Mandatory Site Specific Risk Assessment for Pole & Stay Installation Before carrying out any excavation or drilling work, the following risk assessment must be undertaken to determine the appropriate excavation method.		
1. Utility Prints / Job Pack	**2. C.A.T & Genny Check**	**3. Visual Check**
Do the prints / job pack	Conduct a thorough	Carry out a visual

indicate the presence of Safety Critical services at, or adjacent to, the proposed installation site? Note: a). Safety Critical services are - Gas, Electricity & Oil / Gas Pipeline. b). Where this info is missing or incomplete it must be assumed that such services exist. If there is no confirmation in the job pack that a Linesearch check has been undertaken, work must not proceed. Refer Job back to works originator. Service prints for Water, Cable TV are recommended, but not mandatory.	sweep of the proposed installation site and adjacent area using both the Cat and Genny. Surface mark any services that are identified.	inspection of the area for any indications of utility services. Including, but not limited to the following: Stop Cocks Jointbox's, Lamposts Pipeline Markers E/L Poles Also seek local knowledge, particularly on private land.
Use the outcome of this risk assessment to determine the most appropriate excavation / installation method (A, B, or C) below.		

<u>Choosing appropriate excavation / installation method</u>

Now, use the information obtained from all 3 parts of the risk assessment to determine the appropriate excavation / installation method.

Remember, the method chosen must be based on all 3 elements of the risk assessment!



Reminder: - All Operatives who are required to dig **MUST** be trained in the following:

- The understanding and use of buried plant plans and their limitations
- The use of cable/pipe locators
- Safe digging practice
- The identification of buried utility plant

1.3.3 Operational Safety

Establish who is in charge of operations before any work commences and keep this arrangement in place throughout the task.

Ensure that you have clear system of communication between the unit operator and the pole handler. Use the standard signals in Section 2.5.1 of this document wherever possible.

Always obey ALL the safety rules laid down in the vehicle/crane supplier's handbook and other relevant ISIS documents.

When using the unit always wear appropriate safety clothing and equipment

Roadworks guarding must be carried out as described in the Street works and Road works guarding a code of practise.

When operating such that any part of the vehicle is on the carriageway, wherever possible the working position of the vehicle should be such that poles can be lifted straight to/from the worksite without taking them around the vehicle. For units where poles are stored on the offside this will be with the vehicle facing oncoming traffic.

Always observe general safe lifting and handling practices.

The worksite must be guarded to ensure that unauthorised persons are kept away from the work area.

Ensure that the crane will be sufficiently clear of any overhead obstructions during operations, particularly power lines. Power clearance distances can be referred to in **ISIS** EPT/PPS/B046

The controls of some units equipped with augers are situated at either side of the rear of the units, as on many lorry mounted loaders. The safety aspects of operating a unit which is augering whilst standing on the ground have been looked into and approved by BTSU; this change to allow the unit or the auger to be touched whilst an auger is in the ground is now applied to all poling units. This is a change to previously documented and trained practices. You should NOTE CAREFULLY this does not remove the prohibition on approaching the auger whilst it is moving.

Role & Responsibility of the Second Person/Pole Handler

When manoeuvring poles they should be kept as low as possible and slightly tip heavy to enable control to be maintained. Remember if the pole is lifted high, it is less easy to control the position of the pole with the control line.

A pole must not be lifted or moved by a unit unless it is controlled by a person steadying it with a control line attached to the butt end. The ONLY exception to this is when removing poles from the pole stack when the instructions in this document for sliding a pole off the stack may be followed.

Normally, during lifting operations, the second person/pole handler should be responsible for controlling the movement of crane and load.

The second person/pole handler must not be positioned on top of the vehicle whilst any pole is being lifted or manoeuvred.

1.3.4 Contact with or Damage to Power Services

Although correct operating practices and procedures should avoid the possibility of contact with power services when using these units, if such contact occurs, due to whatever reason, the following notes are intended as guidance.

As the exact circumstances of the contact can vary enormously these can only be treated as generalised guidance and actions should be modified to resolve the situation that exists in the safest possible manner.

Remember that circuit breakers on power lines may automatically reclose a number of times.

1.3.4.1 Overhead Contact with Power Cables

If the vehicle or crane contacts the live section of overhead power cables, it may become 'live'.

Initially:

1. If you are or in the vehicle with your body isolated from the ground, stay where you are. Do not do anything to form a path between yourself and anything else at earth potential (for example the ground).
2. If you are on the ground (for example operating controls, getting equipment out of lockers, controlling the pole) move immediately clear of the vehicle or anything attached to it and stay clear.
3. Warn all other personnel and public to keep away from the vehicle, crane rope or load and ensure that no one will touch the unit.

— Then:

4. If any person on the vehicle has access to driving controls or crane-operating controls, without leaving the vehicle or otherwise touching the ground or any other earthed object, they should try to move the crane until it is clear of the power line or cable. This should only be attempted if there is NO risk of further damage or causing the collapse of cables or cable supports.
5. If the unit cannot be moved clear of the contact, anyone on or in the unit should remain where they are. Anyone not on or in the unit should stay clear. The emergency services and/or your supervisor and the electricity company should be informed to assist anyone who is injured and make the situation safe.

6. It will often be best if BT people stay with the unit to ensure that no one touches it, enlisting assistance from other people to inform the emergency services or other people. If possible, do not leave the unit unattended.
7. If it is essential for anyone on or in the vehicle to leave the vehicle (that is, if the person is in immediate danger from something other than the vehicle being live or there is no one else to give assistance to someone badly injured) they should jump clear as far away from the unit as possible. DO NOT TOUCH THE UNIT AND THE GROUND AT THE SAME TIME.
8. Follow the instructions for dealing with a power contact contained in ESG2 and SFY/CSP/A030 if trying to assist someone who is in contact with a live object or dealing with fallen and potentially live wires.

1.3.4.2 Contact with Underground Power Cables when Digging with the Auger

In this case the auger will act as an earth spike. There may be an explosive release of energy as the cable shorts out.

If it is realised that an underground cable has been struck, release all controls immediately to stop the operation. As the auger is in contact with the ground the greatest danger is from explosion rather than from shock. DO NOT APPROACH THE AUGER.

If you are operating the unit from the ground, do not attempt to lift the auger clear of the ground or otherwise try to operate or drive the unit. This could lift the auger clear of the ground but leave it connected to the cable. Take immediate steps to inform your supervisor and the electricity company concerned, ensuring that the vehicle will not be moved or operated by anyone else. Do not attempt to move the auger or vehicle until the electricity company officials inform you that it is safe.

If the auger can be operated from a platform on the vehicle but off the ground, the operator may remove the auger from the digging area. Other people should be kept clear of the unit during this operation. Guard the excavated area without touching the ground in the close vicinity of the hole, and report the incident.

2 *Use*

Ensure that you are familiar with the function of all the controls of the unit, any equipment locking devices and the limitations of its operation and capabilities. These will be contained in the handbook supplied by the manufacturer and on instruction and warning plates displayed on the vehicle.

Always check the engine fuel level to ensure there is sufficient fuel to complete the job. Never allow the vehicle to run out of fuel whilst engaged in lifting.

2.1 Definitions

In these instructions the term 'Boom' is used to refer to the Boom, Jib and Jib Extensions of the crane. Use any section of the boom to achieve the desired result, having due regard to clearance from obstructions, safe working loads and limitations detailed in the manufacturer's handbook.

2.2 PTO operation

Always engage the parking brake before engaging the PTO.

Engage auxiliary drive/PTO according to vehicle instructions; move the hand throttle to achieve the setting recommended in the manufacturer’s handbook.

Where the PTO is equipped with automatic speed control, remember that as load comes on the crane, the engine and thus the crane reactions will speed up, sometimes suddenly.

2.3 Hydraulic Accessories

Accessories such as pole jacks and tampers may be used from the unit auxiliary hydraulic output (where fitted).

Scrupulous cleanliness is essential when handling the hoses and connectors for the hydraulic accessories as even minute particles of dirt in the hydraulic system can cause danger and/or great damage. It is therefore essential that caps are kept on the connectors when they are not in use or that pairs of connectors are fastened together.

It is essential that connectors are examined and if necessary thoroughly cleaned before connecting. Whenever possible, connectors should be kept off the ground.

To ease hydraulic coupling, it may be helpful to disengage the PTO and operate the control lever a couple of times to release pressure behind the fittings. This should also be done before removing the hoses from the vehicle to avoid leaving the hoses pressurised.

Regularly check the hoses for damage. Hoses which are lightly scuffed may continue to be used, but if there is any damage to the braiding of the hose or which penetrates the braiding do not carry on using the hose.

2.4 Use of Stabilising Legs and Slew Limitation Systems

Do not attempt to operate the unit unless firm support can be obtained for the stabilising jacks. Choose firm level ground to work from wherever possible. Where this is not possible, the manufacturer's limitations with regard to working on slopes should be adhered to.

Note: The maximum allowable angle of operation can be limited. Operation on slopes outside the manufacturer's recommendations can cause misoperation and may be hazardous.

Never attempt to use the crane before the stabiliser legs are adequately extended and lowered. Unless a slew limitation system is fitted this means both MUST be fully extended and lowered. If a slew limitation system is fitted then the crane may be operated on one site with the steady leg on the other side partially deployed. Follow the instructions for the use of any slew limitation system in this document and any manufacturer's instructions carefully.

Take care when extending or retracting stabilising legs. Ensure that there are sufficient personnel available for the job; ensure that you have a secure footing. Ensure that hands are kept clear of the body work as the leg extends or retracts.

Keep feet clear of stabiliser legs when lowering or moving them.

When on soft ground use suitable packing under the stabiliser feet. This should normally take the form of a purpose made spreader plate, but where these are not available or inadequate, use a suitable steel plate or timber packing. Where timber packing is used it must be in good condition (not decayed or damaged) and must be substantial enough - remember it may have to take a load of several tonnes.

Be especially careful when working near excavations or ditches. The pressure from the stabiliser leg may cause the ground to give way.

Ensure the vehicle parking brake is on before deploying stabilisers.

If working on a slope, the wheels must be chocked where vehicle manufacturer’s handbook states this is necessary.

2.4.1 Deploying

Note: The instructions in this Section and Section 2.4.2 are for straight arm type legs. For radial type legs, remove any mechanical latches and deploy the legs keeping hands and feet clear.

Refer to the Manufacturer's Handbook for details of steady leg isolation values and locking systems.

Open any stabilising leg hydraulic circuit isolating valves.

Undo support arm locking device(s) and pull the leg(s) out using the handles provided. Extend stabilising leg support arm(s) to full extent and lock into position.

Extend stabilising leg by any fitted manual extension system if necessary.

Place suitable packing under the leg(s) if the ground is soft.

Operate any sensing levers to 'tell' the hydraulics that the leg is out.

Lower the hydraulic stabiliser legs.

Close any isolating valves.

Note: On all units, when you lower the hydraulic stabiliser legs take care not to lift vehicle chassis excessively. Refer to the manufacturer's operating instructions, but a good guide is to extend the leg(s) until the bulge is removed from tyres or just to take the slack out of the steady leg support arms. Lifting the vehicle too high may cause the vehicle to slide if it is on a slope. If the crane will not operate without the wheels being off the ground, report this to your manager. Wheel chocks may be needed if working on a slope - refer to the vehicle handbook.

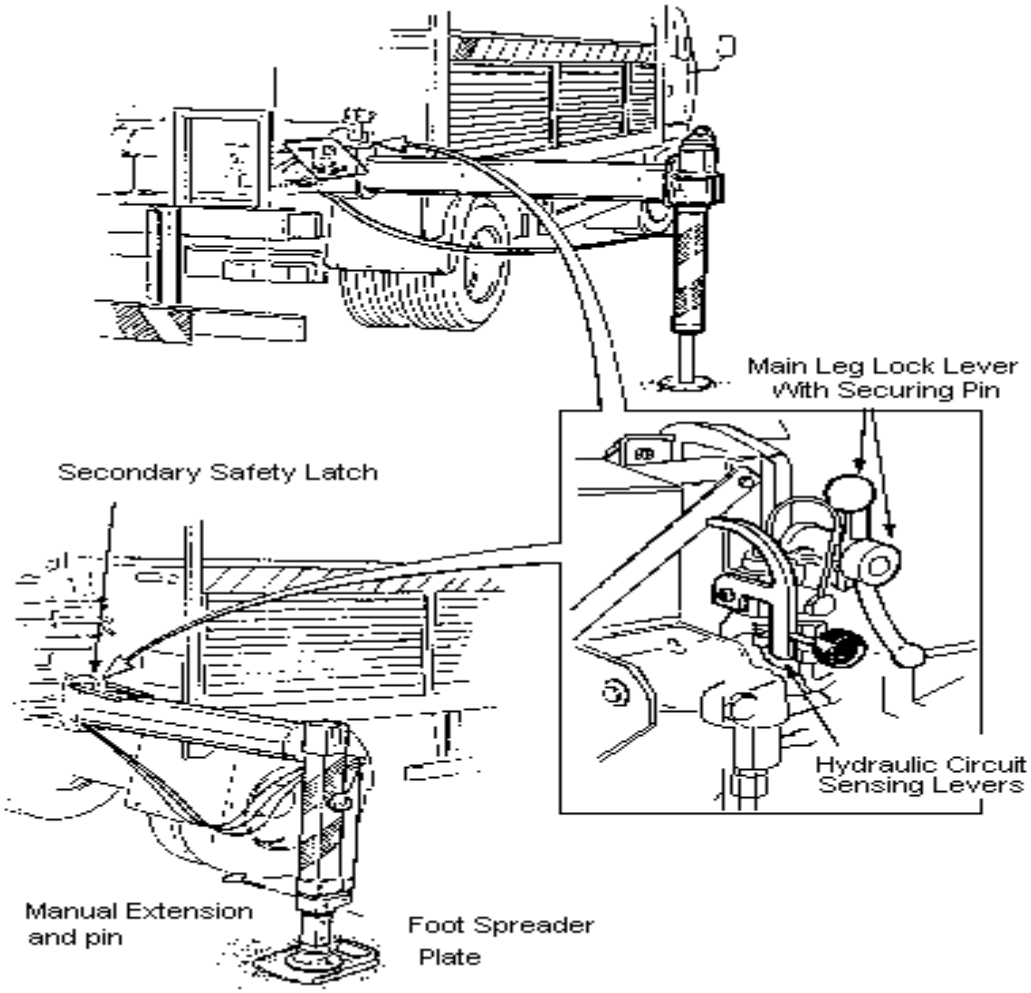


Figure 4 Typical Leg Valves and Latches

2.4.2 Stowing

Open any stabilising leg hydraulic circuit isolating valves.

Raise stabilising legs by hydraulics.

Restore any manual extensions.

Stow any timber packing to avoid tripping.

Disengage any locks and sensing levers, and push leg(s) in using handles provided until the leg support arm locking devices can be engaged and the arms are secure.

Close any isolating valves.

2.4.3 Slew and Load Limitation Systems

On most crane type units used for pole erection, it is very important for safe operation that **both** the steady legs are fully extended and lowered to support the use of the crane. On some units a slew limitation system is now being fitted to enable the crane to be safely used on one side of the vehicle only, and this means that the steady leg on the other side need only be lowered, not extended. Some units are fitted with load limiting systems which allow operation with a limited load with one or both steady legs lowered but not extended.

If a slew/load limitation system is fitted and the unit is operated with the steady leg on the traffic side retracted, do not forget that you may have to use the controls on the traffic side - ENSURE that your roadworks guarding is adequate for this. DO NOT operate the traffic side controls without roadworks guarding - your attention must be on the crane operation, not the traffic.

There are some important points to be remembered when using these systems.

- It is important that the slew/load limitation system is working - it is very easy to forget a leg is not fully deployed and the system is your safeguard against accident - check it.
- It is important that no action is taken which can confuse or disable the system. The system is for you, your colleagues' and public safety so NEVER move the position of the steady legs unless the crane boom is in the stowed position and the vehicle engine is running.
- Do not use the steady legs at any position other than fully retracted or fully extended unless specifically allowed in the manufacturer's operator’s handbook.
- DO NOT take shortcuts when attempting to lift or stow poles with the slew limitation in operation. If you cannot lift or stow a pole whilst lifting it at the correct point of balance as trained, then safely deploy the other steady leg fully to allow the full crane movement to be used.
- Where a slew/load limitation system is fitted ensure that you follow any individual manufacturer's instructions.
- Never disconnect or tamper with any of the slew/load limiting equipment.

2.5 Use of Crane

Never attempt to lift loads greater than the safe working loads shown on the crane's load chart or in the manufacturer's manual. When extending or lowering the boom with a load attached, care must be taken not to exceed the maximum load radius as indicated on the load chart. A load safely handled at a close radius may, if moved to a greater radius, exceed the capacity ratings. When recovering poles, take care that the pole weight will not exceed the maximum capacity of the crane at the extension in use; failure to do this can result in a potentially hazardous situation.

Ensure you are aware of the function and indications provided by any safe load indicator fitted.

When using a unit having automatic speed control for PTO operation, be careful as the engine may speed up as load comes on, causing the action of any function selected to speed up, sometimes suddenly.

Great care should be taken to ensure that pedestrians and traffic are kept clear of suspended poles. When a load is being lifted on or over a footpath, it must be temporarily closed to pedestrians and adequate arrangements should be made for their safe passage around the worksite where necessary. Poles should never be lifted over or into the path of traffic.

Always keep the load as low to the ground as possible. Never lift higher than is absolutely necessary. Never allow the load to pass over any person (including the operator or pole handler).

DO NOT handle slings hooks, shackles, slings or couplings as tension is being applied. If you need to hold a sling in position, hold the main winch rope at a position clear of any loops, hooks, shackles or couplings and release the rope as soon as the sling is secure; otherwise use a piece of wood or other implement and keep your fingers clear.

Normally, during lifting operations, the pole handler should be responsible for controlling the movement of crane and load.

If a load requires steadying use a steady rope wherever possible.

Operate the controls carefully and smoothly avoiding sudden or jerky movements.

If operating in high or gusty wind, ensure you can control the load.

Always ensure that the load is stable before allowing the lifting sling to slacken or allowing anyone to approach the load.

Never stop or start slewing abruptly, particularly with heavy loads.

Fast slewing can be dangerous and can cause the load to swing out and increase the radius beyond the safe limit. On units which have a fast slew rate, 'feather' the controls very carefully.

Take care to avoid hitting the bolsters with the crane jib or hydraulic cylinders.

Ensure that you always lift vertically. Position the hook of the crane directly over the slinging point; otherwise the load will swing as its weight is taken up by the crane. Always keep the winch rope/lifting sling vertical. The only exception to this is when removing poles from the pole slack when the instructions in this document for sliding a pole off the stack may be followed.

Never use the crane to 'pull' a sling from under a pole.

Where a winch is fitted, before lifting a load, examine the winch drum. If the rope turns are unevenly distributed along the drum or loosely wound, the rope should be unwound and rewound evenly under slight tension before lifting the load.

When using a unit with a winch, be very careful when extending the boom to let the winch rope out to compensate when necessary. Failure to do this can result in damage or rope failure.

Many units with a winch have the last few turns of winch rope painted red. DO NO unwind these from the winch drum. (Look at crane manual for details).

On units with a winch, during actual recovery the pole should only be lifted with the boom of the crane, NEVER with the winch.

When any pole is being lifted or manoeuvred, all personnel not involved in the operation should stand clear. No personnel should be positioned on top of the vehicle.

Use the boom lift, slew, knuckle, extension and winch (where fitted) as appropriate to raise and manoeuvre loads.

Cranes must be fitted with a hook with a safety catch. Poles **MUST NOT** be lifted, installed or recovered using open type hooks.

If you move from one type of unit to another, particularly from a unit with a winch to one with a knuckle crane or vice-versa, ensure you have the necessary conversation training and take care and operate the crane controls slowly at first as the different types need different movements to achieve the same result.

Where a manual extension is fitted, take care when adjusting it that it does not slide out of the boom out of control. Position the crane boom as level as possible when adjusting the position of a manual extension. Manual extensions will normally have to be completely stowed on cranes without a winch before loading or unloading poles from the unit. Ensure that any manual extension is adjusted so that the lifting sling does not catch or rub on the auger mounting attachment.

The crane operator should be aware of the position of the load at all times. If he cannot see the load then the pole handler should signal requirements to the operator. If necessary a third person should relay signals. Ensure you

have clearly understood signals for all operations where communication is required. Wherever possible use standard hand signals which are shown in Section 2.5.1 of this document. If these are not appropriate or adequate for the work in hand ensure you agree a clear set of signals before you start.

Sunglasses should be worn by operators and pole handlers when necessary to ensure clear vision of the load is maintained in bright or sunny conditions.

Crane operators and pole handlers should be over 18 and medically fit, with particular regard to eyesight, hearing and reflexes and be physically capable of carrying out the operations.

2.5.1 Hand Signals

The hand signals overleaf are standard ones for crane operations.

Signaller should stand in a secure position where THE SIGNALLER CAN SEE THE LOAD AND CAN BE SEEN CLEARLY by the driver. Face the driver if possible. Each signal should be distinct and clear.

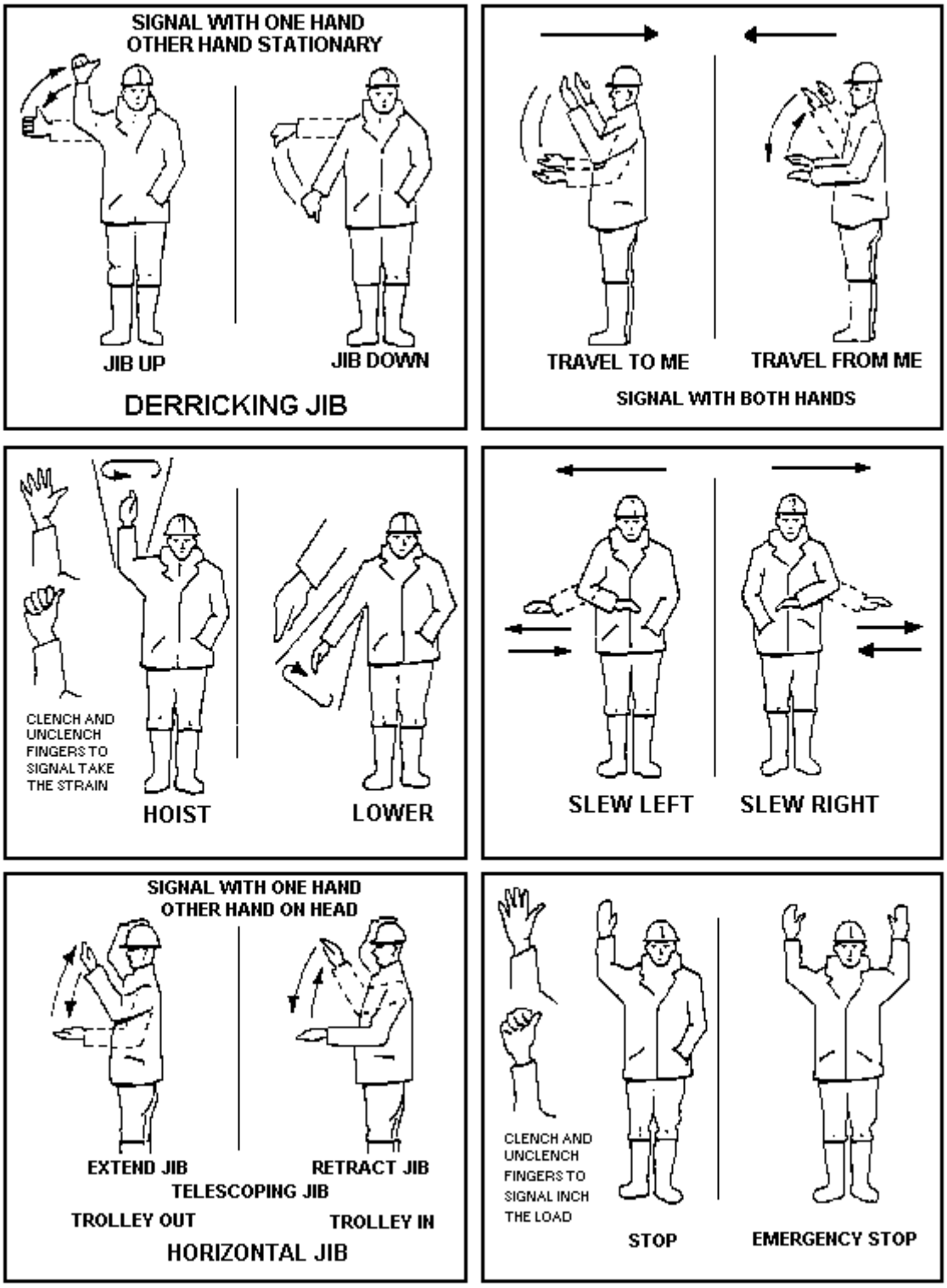


Figure 5 Hand Signals

2.6 Use of Auger

Always wear suitable eye protection when carrying out the following operations if you are in such a position that earth or duct from the auger can fall or blow into your eyes.

Remember, before using the Auger, it is mandatory to undertake the 3 stage risk assessment (detailed within section 1 of this document) to establish the location of any other utlilities plant, relative to the proposed excavation area. See also SFY/HSH/D057

2.6.1 Auger release

Before releasing or stowing the auger ensure that all personnel are clear of the possible arc of swing should the auger stowage fail.

NEVER STAND OR WALK IN THE ARC OF SWING OF THE AUGER ONCE THE STOWAGE LATCH (ES) HAS BEEN RELEASED.

When releasing and lowering the auger from the crane stowage position, either the boom should be lowered sufficiently to ensure that in the event of the stowage mechanism failing, the tip of the auger would strike the ground rather than swing and endanger anyone in the vicinity, or the auger should be lowered under control at a high level.

FAILURE TO OBSERVE THIS PRACTICE CAN RESULT IN SERIOUS INJURY.

If necessary, lower the boom down as far as possible and disengage any mechanical lock or latch which needs to be manually released. DO NOT release any hydraulic/pneumatic latch until this has been carried out and all personnel are clear of the boom. If it is necessary to raise the auger slightly to take the weight of the auger off the latch, move the auger control to wind up the storage strop, raising the auger slightly to relieve the latch of the auger weight. During this operation staff must be clear of the auger and should only disengage the latch when the auger is stationary.

To lower the auger, either

Check that any boom extension is fully retracted. Raise the boom to approximately 50° elevation and rotate to a safe clear area. Move the auger control to wind up the storage strop, thus raising the auger slightly to relieve the storage mechanism of the auger weight (DO NOT OVERWIND). Operate auger release control and rotate the auger to unwind the storage strop. Lower boom slowly whilst continuing to rotate the auger to unwrap the remaining storage strop. The strop should automatically release. If it does not, lower the boom and release it manually (see Figure 6);

or

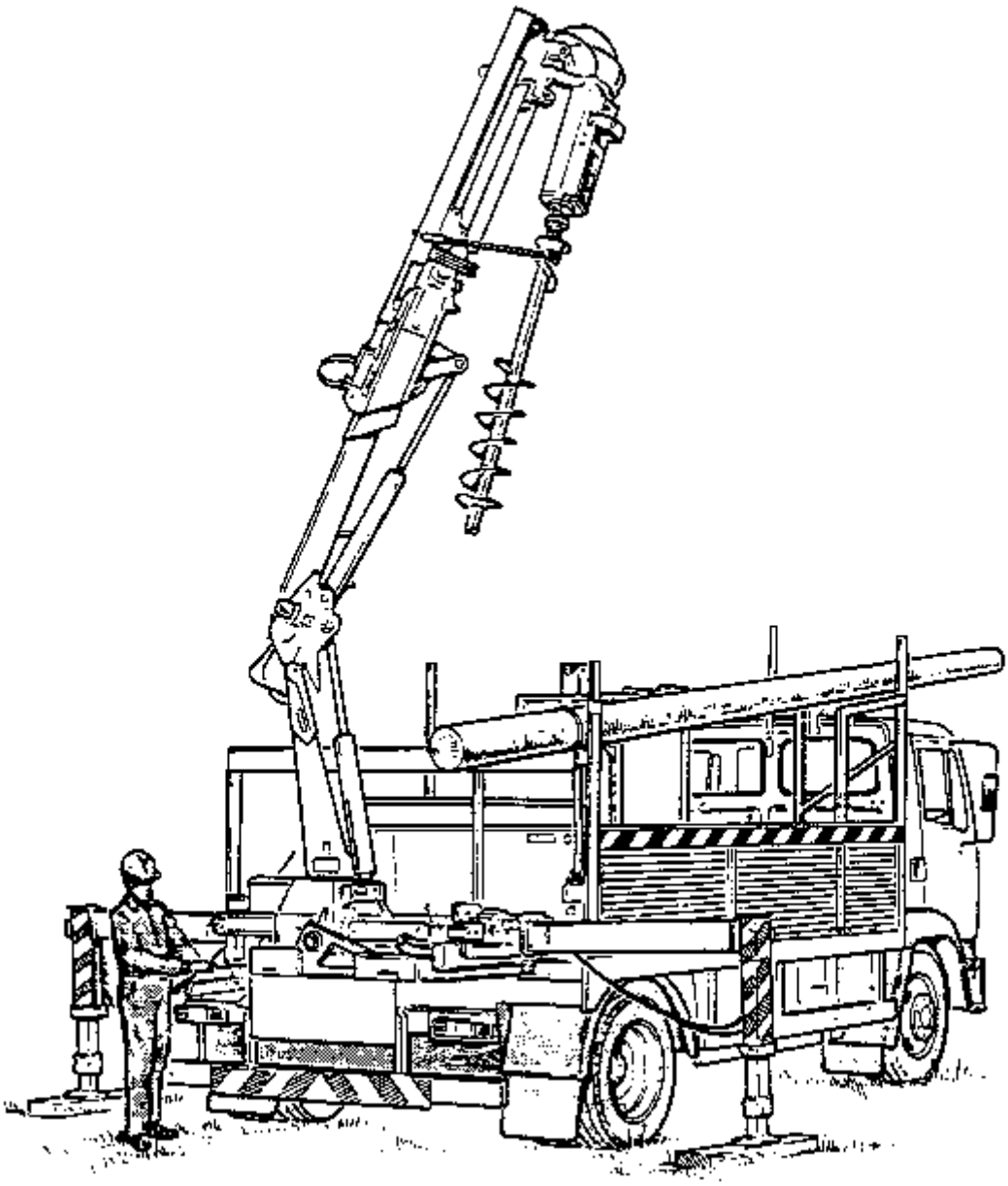


Figure 6 High Level Auger Deployments

Lower the boom sufficiently to ensure that, in the event of the stowage mechanism failing, the tip of the auger would strike the ground rather than swing the endanger anyone in the vicinity. Move the auger control to wind up the storage strop, thus raising the auger slightly to relieve the storage mechanism of the auger weight (DO NOT OVERWIND). Operate auger release control and rotate the auger to unwind the storage strop, raising the boom as the auger descends to keep the auger just clear of the ground. The strop should automatically release. If it does not, release the strop manually when the auger is vertical (see Figure 7).

If a stowage position is provided for the strop secure it.

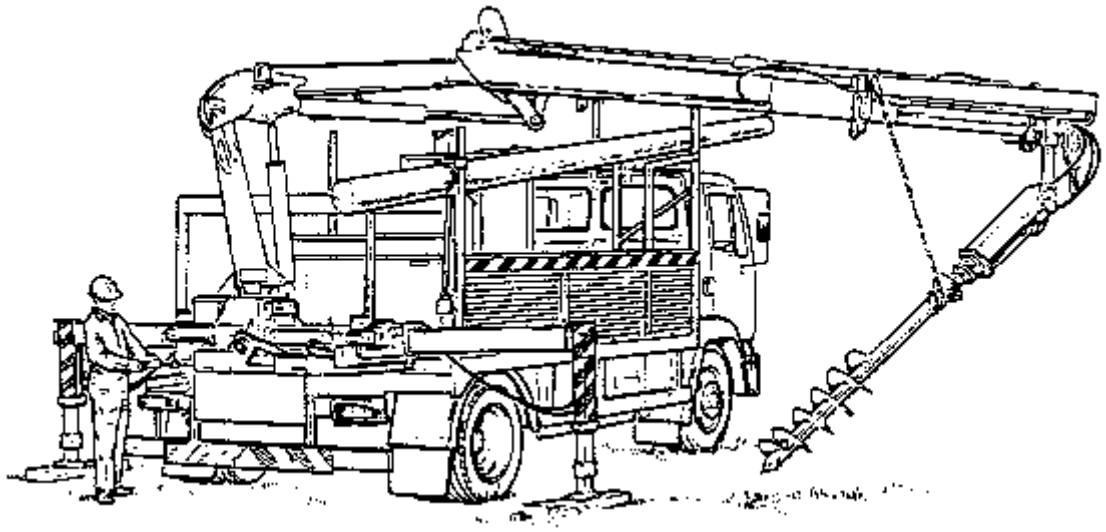


Figure 7 Low Level Auger Deployment

2.6.2 Auger Extension

If required the auger can be extended in steps up to a maximum of 1.2m by removing the bolt/pin through the auger and the hexagonal drive shaft and withdrawing the shaft from the auger until the required hole is in line.

To extend the auger, either

Place the auger in a partly bored hole, or screw the auger into the ground. For safety reasons the auger should be **at least 1m deep**. Withdraw the pin securing the auger to the shaft (it may be necessary to rotate the shaft slightly, keep fingers clear!). Raise the crane to withdraw the shaft to the required position and reinsert the pin;

or

For units without a winch, the auger should be manoeuvred until it is just above the ground. If necessary rotate the auger until the auger lifting eye on the auger motor mounting and the lifting eye on the auger itself are roughly in line. Lower the auger until it just rests on the ground. Attach the special lifting sling provided with the unit, one end onto the auger lifting eye on the auger motor mounting and the other onto the lifting eye on the auger itself, never onto the stowage strop hook. On many units the strop attaches via a shackle to a mounting hole on the cup of the auger. (It is important that the correct sling is used, if you are not sure it is the correct one, check.)

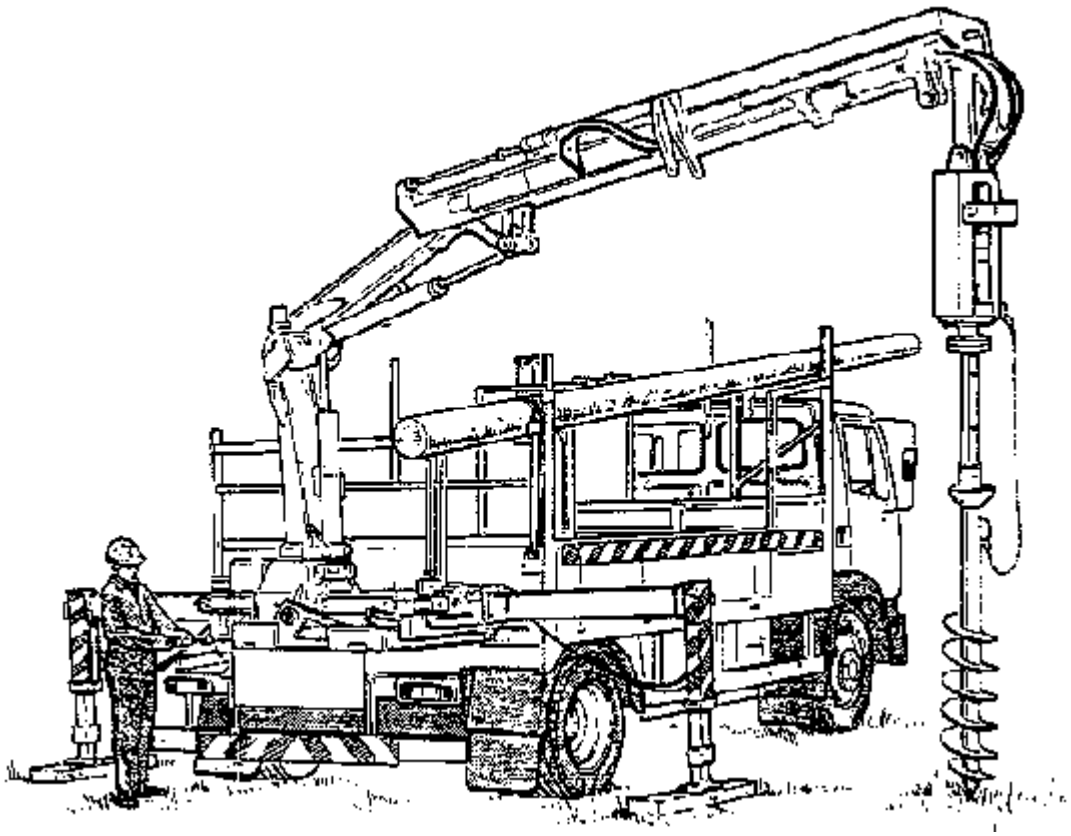


Figure 8 Extending or Removing Auger without Winch

For units with a winch the winch rope should be paid out until the winch rope can be attached to a Sling Lifting 4A reeved around the shaft of the auger below the cup. If the auger has a lifting eye the hook should be attached to it (never onto the stowage strop hook).

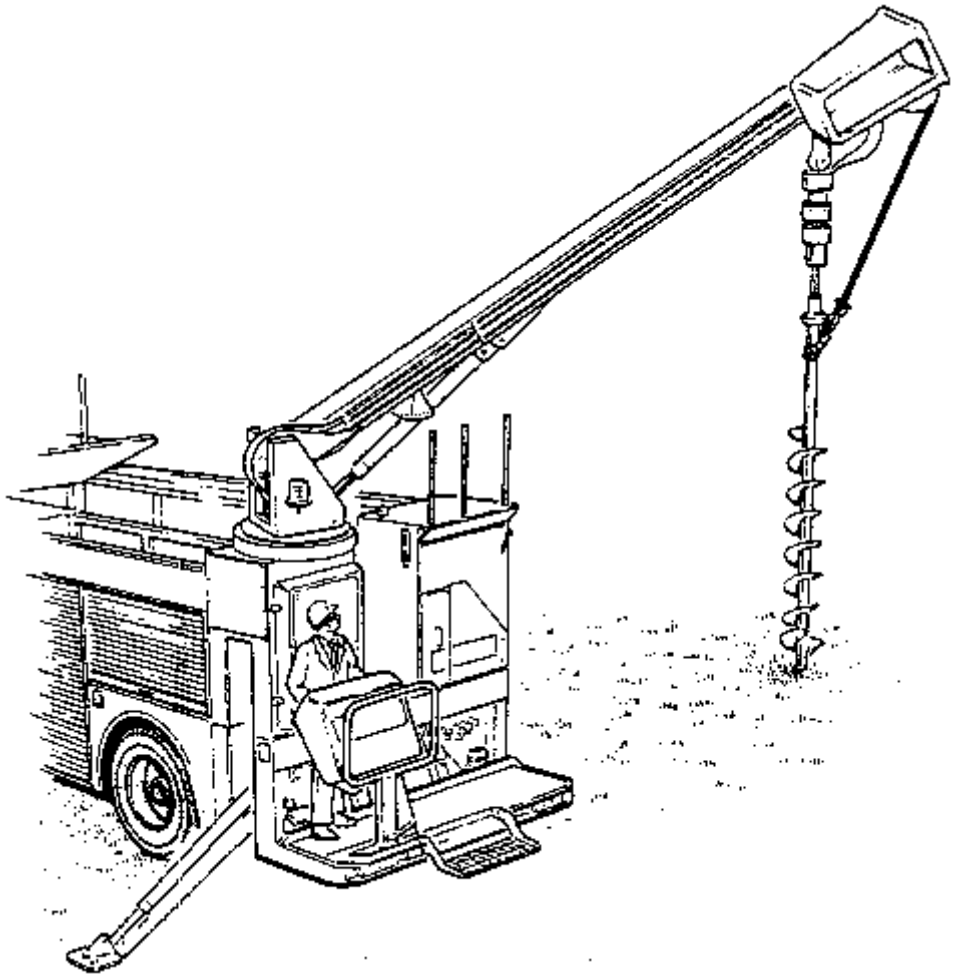


Figure 9 Extending or Removing Auger with Winch

Then on either unit remove the auger retaining bolt/pin. (It is best to align the pin so that the unit operator can see the holes when trying to line them up.)

Whilst one operator holds the auger just under the 'cup', clear of the lifting chain or rope, the boom should be slowly raised until the shaft is in the required position paying out an appropriate amount of winch rope if the unit is fitted with a winch. Replace the pin and remove the lifting sling or winch rope.

Ensure that signals/communication between crane operator and other person are clear, ensure that fingers etcetera are kept clear of moving parts and do not stand under the crane. Use safe means of access (for example Steps, Platform 2 tread) if you cannot reach the pin/bolt or reach to attach the lifting chain/hook from the ground. DO NOT climb up the auger.

To retract the auger, reverse the above process.

2.6.3 Auger Removal

The auger removal should be deployed and lowered until it is just above the ground.

Attach the special lifting sling or winch rope as described above and proceed as if extending the auger. Continue until the auger shaft is entirely out of the auger and the auger is supported on the chain. As the shaft clears the auger the person holding it should initially support the auger until the chain or rope is fully supporting the auger, and then move clear. Once the person supporting the auger has moved clear, the boom should be lowered or the winch unwound until the auger rests horizontally on the ground. (Alternatively the auger may be lifted onto the vehicle.) Ensure that the auger is stable and will not roll, and then remove the lifting chain/strop. Do not leave the chain on the boom.

Or, for either type of unit -

Having checked a suitable piece of ground for services 'screw' the auger at **least 1m** into the ground until the auger is firmly held. Once the auger is stationary, remove the auger securing pin and lift the shaft from the auger. Guard the auger.

2.6.4 Auger Replacement

For units without a winch -

Attach the lifting chain/strop to the lifting eyes on the auger drive and auger, (if the auger is on the vehicle lift it to the ground). Raise the auger until the tip is just on the ground; the other person should now guide and steady the auger to a vertical position directly under the auger drive shaft, keeping both hands under the cup of the auger and feet clear.

The crane operator should then very slowly lower the boom so that the hexagonal shaft re-enters into the auger, taking care that if the drive shaft does not enter the auger correctly the download movement is stopped immediately. When full penetration of the shaft has been achieved, the auger retaining bolt/pin should be replaced and secured. The lifting sling should then be removed. The auger may then be stowed in the normal manner.

For units with a winch -

Follow the procedure above using the winch rope in a reversal of the process described in Section 2.6.2.

Or, for either unit

Position the shaft over the auger (which is held firmly in the ground) and lower the shaft until the appropriate hole in the shaft lines up and replace the pin.

2.6.5 Auger Stowage

ALWAYS STOW THE AUGER IN THE MANNER DESCRIBED HERE.

Clean the auger of earth before stowage to prevent earth falling during other operations.

Retract any auger extension following the reverse procedure to that used to extend the auger.

Ensure that the auger release control has been restored if necessary, and that the stowage strop has been released. Attach the storage rope over the pin on the auger stem.

Move the auger clear of everybody and do not forget any earth or stones left on the auger may fall.

Rotate the auger just sufficiently to take up the slack storage rope, but keeping the auger vertical. Raise the boom to approximately 50° elevation whilst rotating the auger to just take up the slack in the auger rope. Once the boom is elevated to 50° continue to wind up the auger until it latches into the storage bracket. This method ensures that the strain on the rope is relieved and that if the rope breaks the auger will not swing into anyone. Keep the auger stowage rope between the hook and the cup. Do not overwind. Check that the hydraulic/pneumatic latch has engaged.

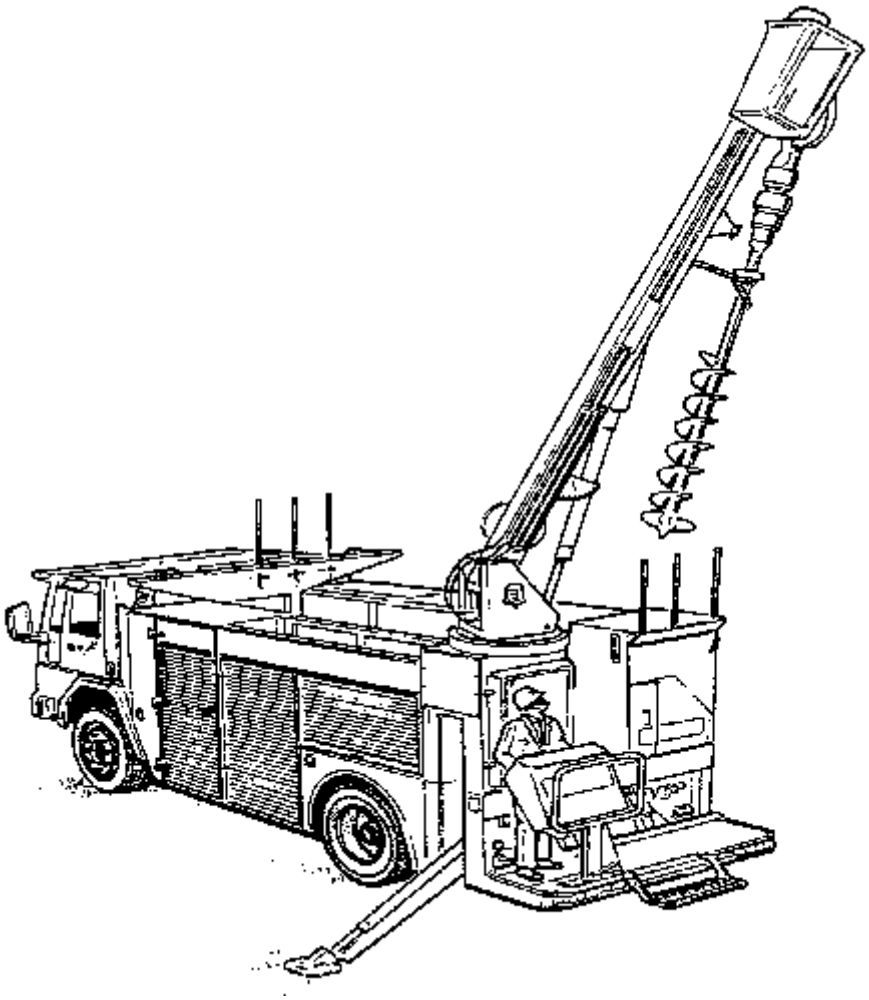


Figure 10 Auger Stowage

If necessary lower the boom right down and replace any manual stowage latch, once again never stand under the auger. Lower the auger onto the latch to relieve the tension in the rope.

2.6.6 Auger Teeth and Sizes

The section below on auger teeth and sizes applies to many units in use in BT. Units may be fitted with special auger teeth. If in doubt, refer to the manufacturer's handbook. Most poling units are normally supplied with either a 360mm (14 inch) diameter auger or a 300mm (12 inch) auger. Butt sizes of new poles are normally a maximum of 300mm diameter for light poles and 350mm for medium poles. If the auger you have does not suit your needs, fit an alternative size. Rock drilling augers may also be purchased for use with many units.

Digging teeth on pole hole augers are designed to be field replaceable. Teeth should be turned round or replaced when significantly worn to maintain digging efficiency and to prevent wear to the auger itself. Teeth are normally

alloy steel forgings, and are held in specially designed holders to provide easy replacement. Teeth are often different shapes for the centre (pilot bit), the inner teeth (super or chisel teeth) and the outer teeth (wisdom teeth). Tungsten carbide teeth or special 'rock teeth' may be fitted to some augers.

Replace teeth with equivalent types.

Pilot teeth are normally secured using a bolt and may be replaced by removing the bolt. Ensure that the bolt is replaced, if worn, along with any locking arrangement for the nut. Other types of teeth apart from alligator or rock teeth (which are conical pointed teeth) are normally held firmly in the holder by a short length of round solid rubber known as Rubber Lock.

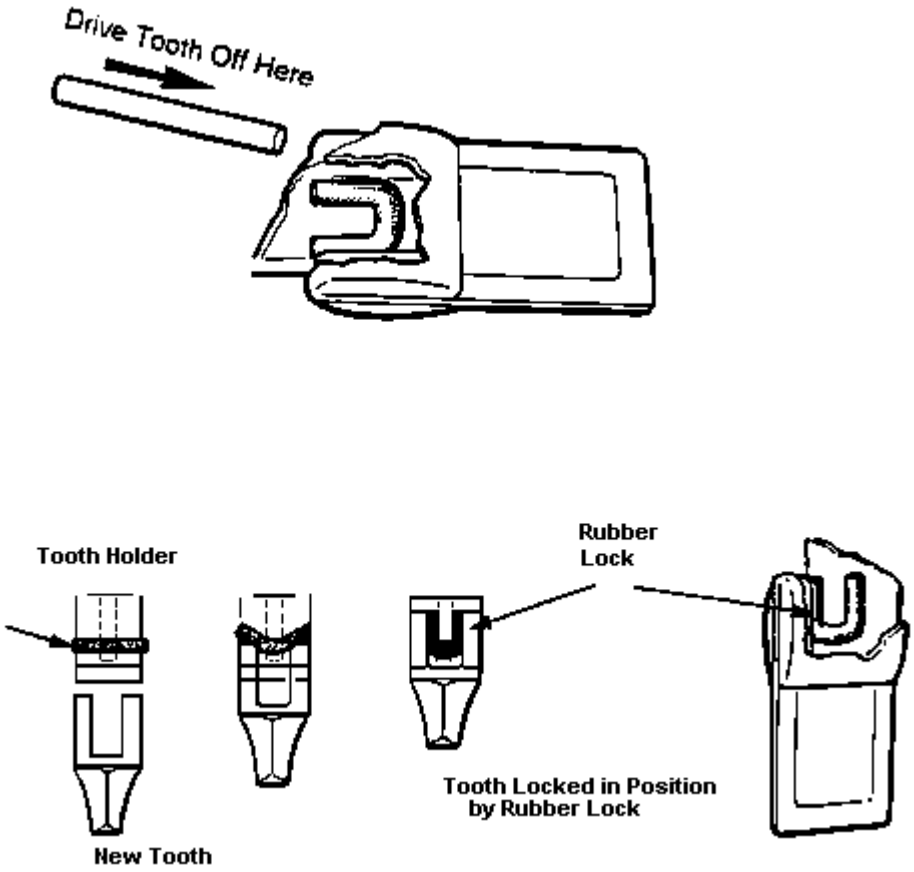


Figure 11 Auger Tooth Replacements

To remove a tooth, drive it off using the correct tool or a soft tapered drift. There is a cut away in the holder to enable the drift to be used against the back of the tooth. The Rubber Lock should be examined, and if it is in good condition it may be reused, but if it shows signs of wear it should be replaced (see Figure 11).

To fit a tooth cut a new length of rubber lock equal in length to the width of the tooth (or reuse the old Rubber Lock) and insert it through the hole in the tooth holder. Push the tooth onto the holder and lightly drive home with a soft faced hammer or hammer and wood drift. Tungsten Carbide teeth must never be hit

with a hammer; always use the correct insertion tool or drive in with wood protecting the tooth. (The rubber is compressed between the edges of the holder and the inside of the tooth, locking the tooth in position).

Fit tungsten carbide teeth so that the long face of the tungsten carbide insert is facing upwards. Fit 'super' or 'chisel' teeth so that the ridge along the tooth is facing upwards. Wisdom teeth can be reversed to counteract uneven wear.

Alligator or rock teeth should only be removed or replaced with the special insertion/removal tool supplied by the manufacturer (see Figure 12).

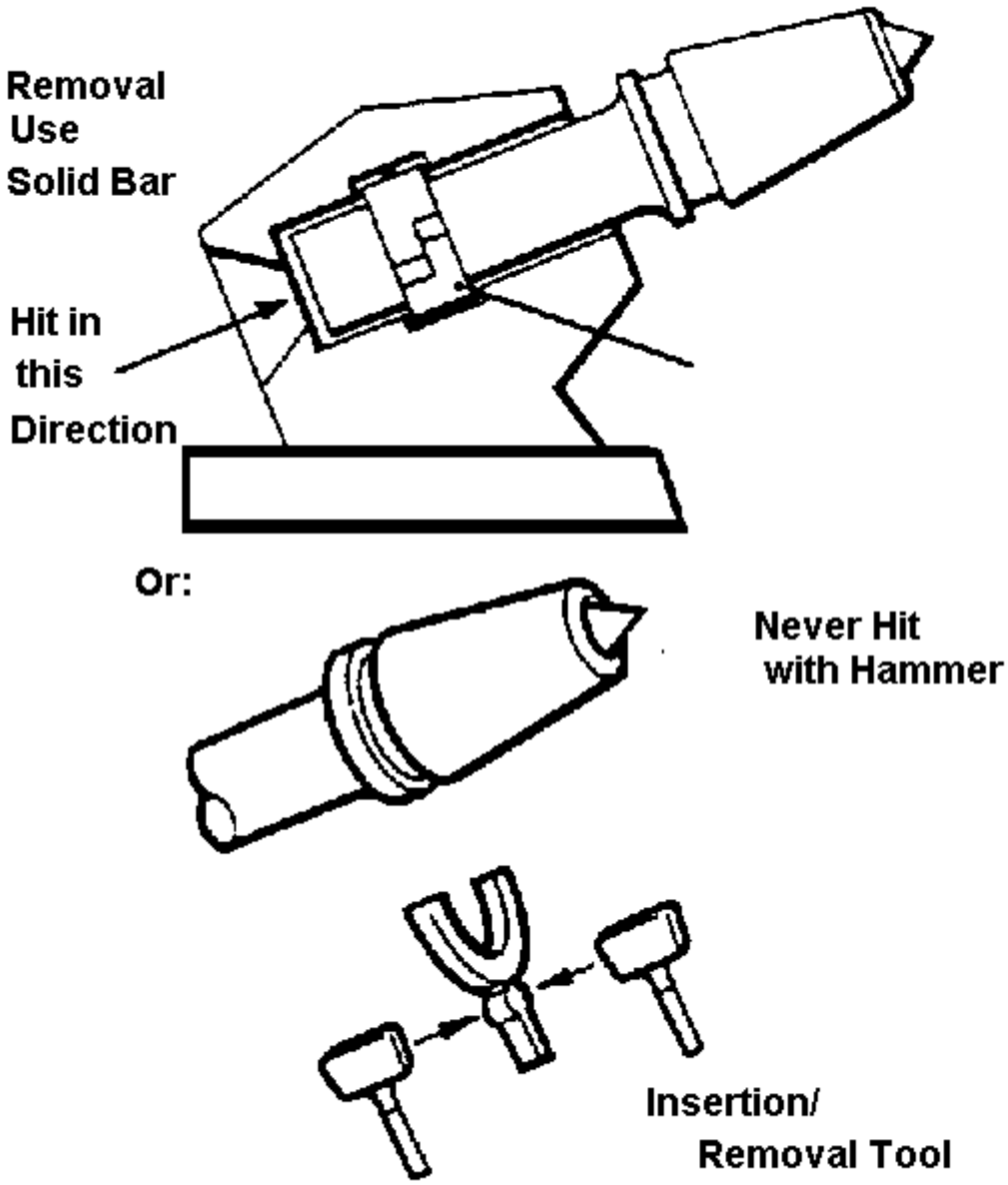


Figure 12 Removal and Replacement of Rock Teeth

2.7 Use of Soil/Spoil Skips

2.7.1 Rigid skips

Some poling units are equipped with rigid soil/spoil skips. These are equipped with a tipping mechanism. The skip is lifted (using the crane) by the handle which is connected to the body of the skip near the bottom. The skip is retained in the upright position by a latch (like a pair of fingers) which locates over the handle.

Never lift the skip unless the latch(s) are locating the handle and preventing the skip from turning over.

To empty the skip lower the skip to the floor. Release the latch using the end of a spade or other tool. DO NOT use your hand or fingers as they may be trapped if the handle moves suddenly. Having ensured everyone is well clear, lift the skip upwards slowly and gently on the crane until the skip tips over and empties. During the operation keep the lifting rope/sling as vertical as possible and ensure everyone is well clear.

To relatch the handle, do not attempt to lift the skip manually. Lower the skip on its side and lower the handle until the latch can be re-engaged using a suitable tool. Bring the crane over the handle and lift the skip upright. With the skip still on the ground the check the engagement of the catch before lifting again.

Always stow the skip in its correct position on the vehicle, and ensure it is adequately secured.

2.7.2 Spoil Bags

Where small bags are used they should be filled so that they can be safely lifted onto the vehicle manually.

Crane lifted large spoil bags must be used in accordance with the manufacturer's instructions.

Ensure that the crane will not be overloaded:

1. When lifting a spoil bag with more than one lifting strap always use a suitable shackle to connect the straps to the crane hook.
2. Always ensure that any release mechanism is correctly secured and that it will not catch on anything as the bag is lifted.
3. Take care that the bag does not come into contact with any sharp edge or object which could rip the bag.
4. Ensure the bag is adequately stowed during transport.

5. Only empty the bag in accordance with the manufacturer's instructions - ensuring everyone is clear.
6. Take extreme care to keep clear if discharging into a skip.

3 *Lifting Poles*

When using a crane only lift poles in the manner documented in this ISIS. **NEVER** lift more than one pole at a time with the single sling method as described.

Always load and unload poles in order - **DO NOT** take shortcuts by trying to move poles from underneath others.

A pole must not be lifted or moved by a unit unless it is controlled by a person steadying it.

A line (Line Sash 15 or Drawrope with thumb knots every 300mm) should be attached to the butt of the pole as a steady line at the beginning of the operation so that control can be retained throughout the operation. In the case of wood poles tie the line on with a Timber Hitch or a Round Turn and Two Half Hitches or a reeved spliced loop. In all cases ensure that the rope will not slide off the butt. If the butt is very slippery with mud etcetera, lightly staple the rope to the pole. In the case of hollow poles tie the line through the cable holes to prevent it slipping using a Round Turn and Two Half Hitches or a Bowline.

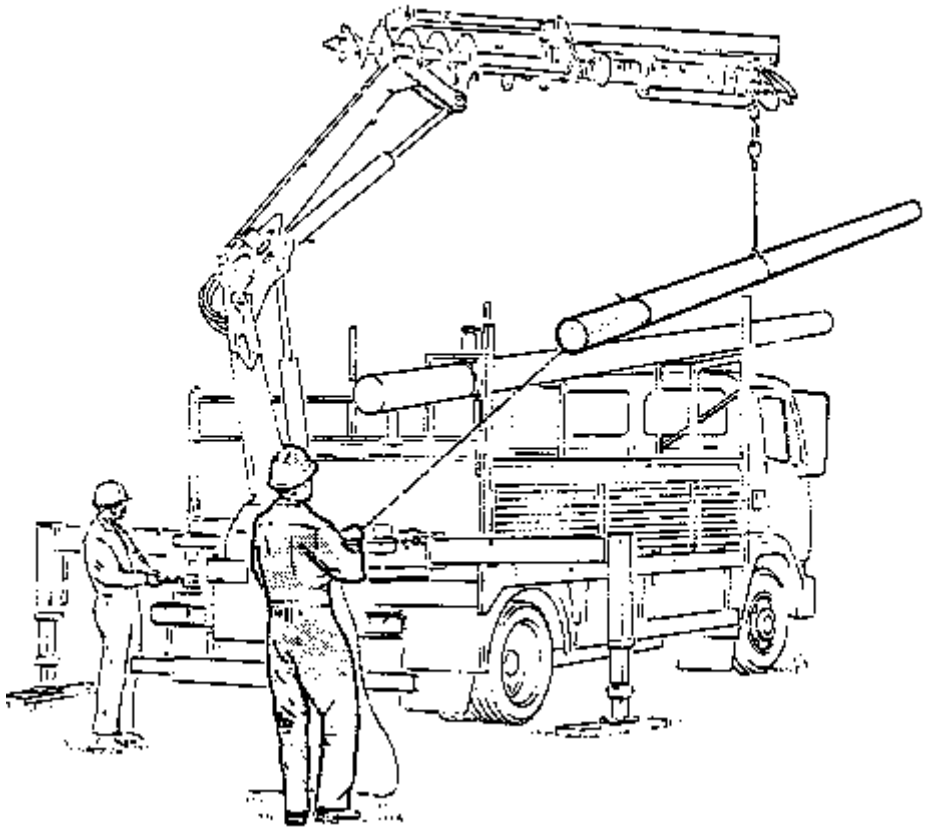


Figure 13 Lifting Wood Poles

3.1 Lifting Wooden Poles

For wood poles the suspension point of the pole must be chosen so that the pole is very slightly tip heavy during all loading, unloading and wherever possible other lifting operations except when actually planting or recovering a pole. This is done to ensure a safe stable configuration for loading and manoeuvring poles. Dragging the poles 'butt heavy' over the rear of the vehicle can result in a hazardous situation.

In addition, a wood pole which is set down heavily on the butt can break due to the way that shock waves travel up and down the pole. This method of slinging reduces the possibility of this damage.

When lifting or manoeuvring a wooden pole, a Sling Wire Rope 1A (1.4m) should be connected to the pole first. Pass the sling around the pole at the appropriate balance point and thread one eye through the other (reeved).

Note: A Sling Wire Rope 1A has a safe working load of 600kg when used in a reeved condition.

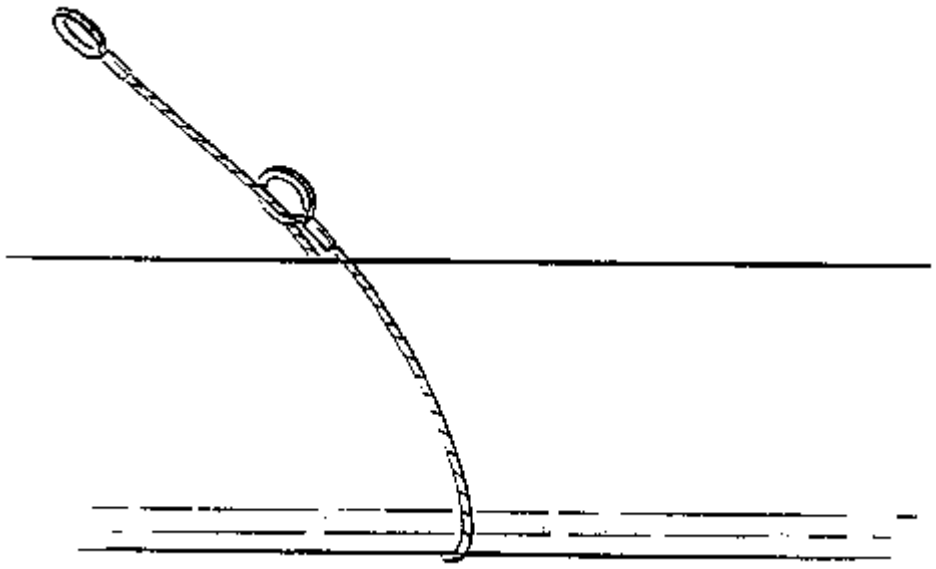


Figure 14 Reeved Slings

When lifting a wood pole, lift the pole slightly and ensure that the balance is correct, that is slightly tip heavy. To check this push down on the pole butt - as a guide you should be able to push the pole butt down with your fingers. If it is not balanced correctly, lower the pole again and move the sling as appropriate.

For wood poles over 600kg use the alternative sling detailed below.

Wire Rope Sling 6 x 19 fibre core construction, 1.7m long with reevable thimbles fitted to each end. Rope to be a maximum 12m diameter if possible and should have a minimum certificated safe working load in the reeved condition suitable for the pole to be lifted.

3.1.1 Crane Type Timber Pole Grab

Where a number of wood poles have to be lifted and moved (say to access poles in the centre of a stack) then a crane type timber pole grab may be used where available.

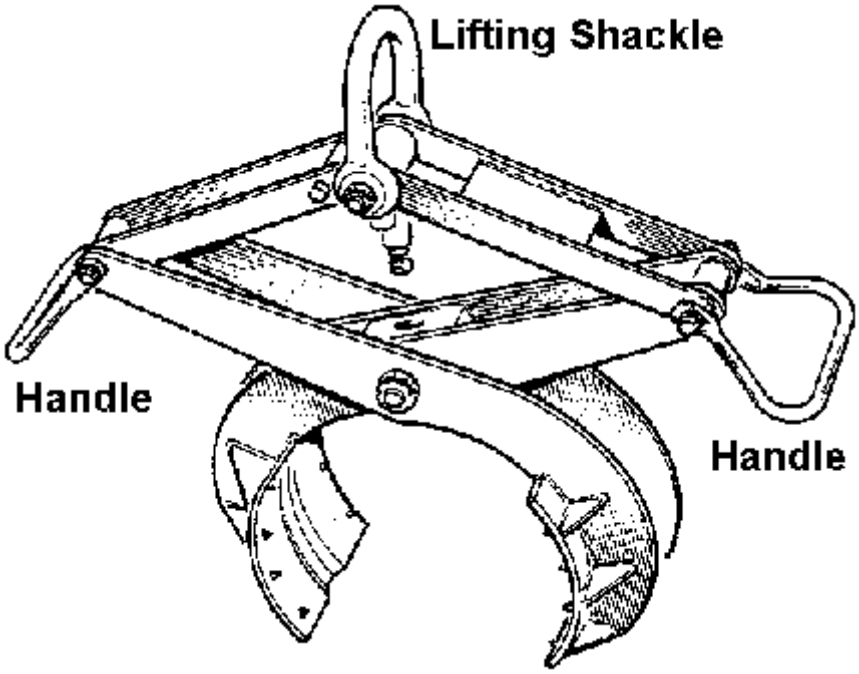


Figure 15 Crane Timber Pole Grab

This grab has a safe working load of 500kg and consists of a pair of heavy-duty scissor-action jaws coupled via links to a lifting shackle. A curved surface plate is welded to each of the jaws and eight pointed studs are riveted to each curved plate to prevent poles slipping during lifting operations. The appliance can be used with any suitable lifting device or vehicle/crane.

The appliance is equipped with an automatic locking-and-release mechanism situated between the upper links of the scissors. A key projects from the underside of the locking mechanism and this key engages with a slotted link situated between the lower leaves of the scissors. As the curved jaws are opened to their fullest extent the scissor action compresses the locking mechanism, causing the projecting key to turn through 90° after it has passed through the slotted link. In this condition the jaws are locked in the open position.

With the jaws locked in the open position the appliance is raised (by the crane or other lifting device) and then lowered on to the pole to be lifted. The weight of the appliance resting on the pole again compresses the locking mechanism, causing the projecting key to turn through 90° so as to bring the key and the slotted link into alignment. Raising the timber grab will then close the jaws so that the pole can be lifted.

When using the grab poles should be lifted tip heavy and controlled with a sash line as normal. Always ensure that the grab has fully enclosed the pole - DO NOT lift poles which are only partially within the jaws.

When using the crane connect the pole grab by placing the lifting shackle in the hook.

If lifting the grab by hand, only lift by the handles provided at either side or the lifting shackle (see Figure 15).

3.2 Lifting Hollow Poles

Wire rope slings must not be used to lift hollow poles. They can damage the outer coating.

Like wood poles, the slinging is set so the pole is always lifted tip heavy except when actually planting or recovering the pole. Because the surface of hollow poles are so slippery and the weight is light, a retaining hook under the door lintel or cable holes is used to ensure that the lifting sling cannot slip. This is attached to the lifting sling by a second sling or may be part of a special sling configuration. Hollow poles should not be lifted without the lifting sling being secured.

Although hollow poles are light their thin sections make any sudden movement of the pole hazardous if any part of the body is in the way. Handle them properly.

Hollow poles are lifted with a Sling 4A. To position correctly, use a securing sling, either a Sling 10B or other suitable arrangement.

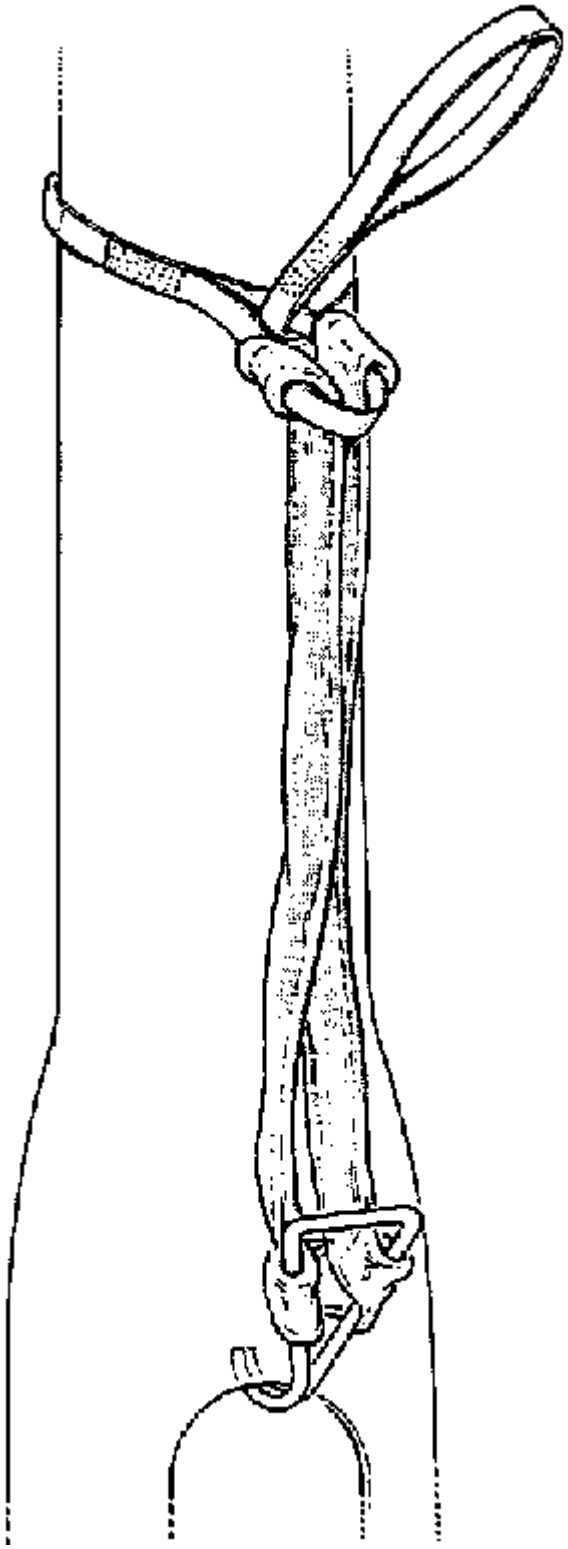


Figure 16 Hollow Pole Slinging

3.2.1 Lifting Hollow Poles without a Sling 10B

Two types of fabric sling and an anchor hook are required when lifting hollow poles. The pole is lifted using a Sling Lifting 4A (1m fabric sling). A second round sling must then be secured through the reeved eye of the lifting sling and also reeved through the securing hook under the door lintel or cable holes (see Figure 16).

The length of the securing sling(s) must be chosen to ensure that the balance point of the pole is correct for the operation. Where necessary, slings should be linked together to provide an adequate length. A short sling should be used when lifting the pole to ensure the correct tip heavy position. The positioning sling should always be located under the pole door or cable holes with a hook and the hook/sling end should be taped in position to ensure that it cannot slip out. The anchor hook is a Wire Hook Type 01212 available from SpanSet Limited (01606) 737494) - the hook should be marked with its Safe Working Load and supplied with a Test Certificate.

A Sling 10A used as the securing sling will set the correct position for lifting the pole prior to planting or recovering the pole. It should never be used on it's own for lifting the pole (see Figure 17).

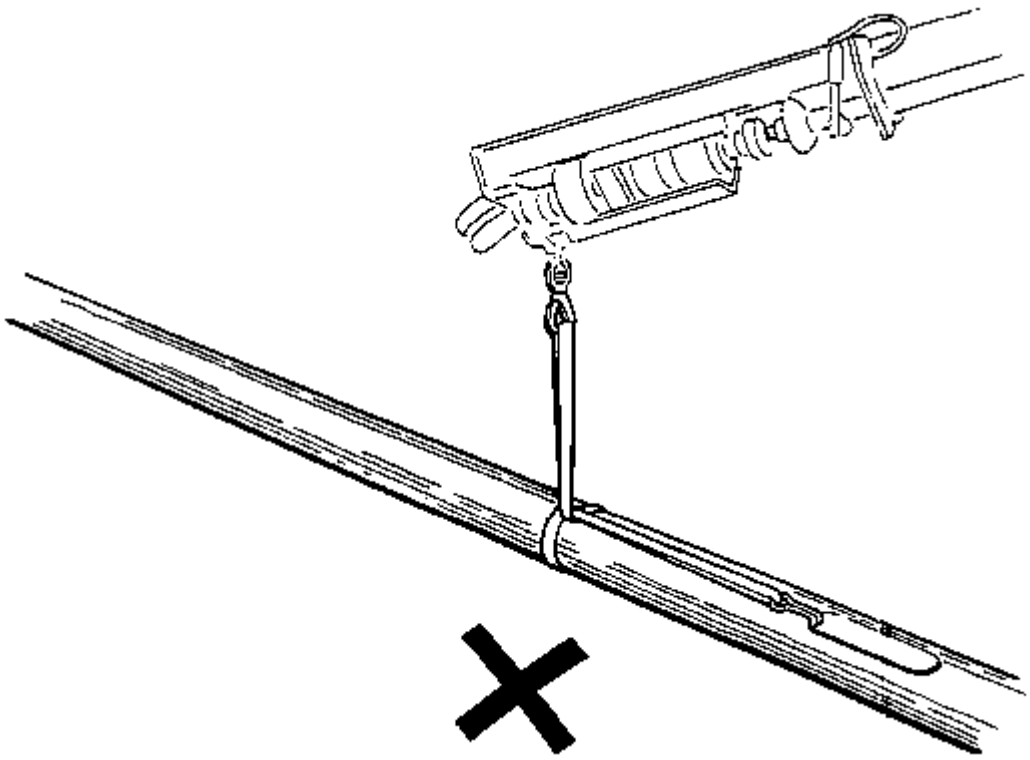


Figure 17 NEVER USE SLING LIFTING 10A ALONE

3.2.2 Lifting Hollow Poles with a Sling 10B

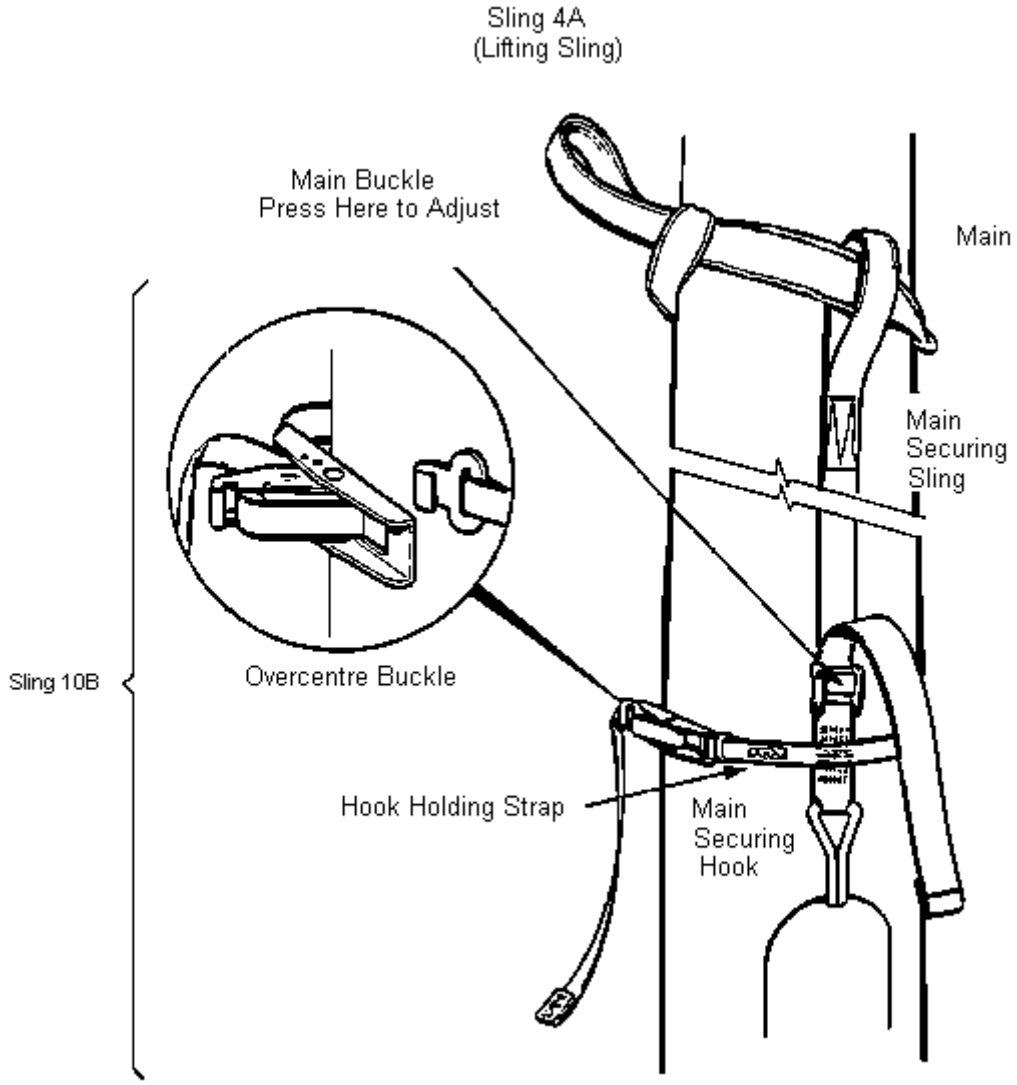


Figure 18 Sling 10B

If a Sling 10B is used (see Figure 18) this has a holding strap for the anchor hook and an adjustable securing sling. To use the Sling 10B, check it for damage, then extend the main securing sling to its maximum length by pressing down on the press to release portion of the main buckle and pulling the looped end of the main sling. Place the hook under the door lintel or a cable entry hole as appropriate and having ensured that the overcentre buckle is released; pass the holding strap around the pole. Fasten the hook on the short end of the securing strap to the backplate of the overcentre buckle and pull the strap to take up the slack. Use the overcentre action of the buckle to secure the sling and securing hook. (Ensure that the overcentre lever clips into place.)

Reeve the Sling Lifting 4A around the pole, passing it through the loop at the end of the Sling 10B. Position the Sling Lifting 4A at the correct point, testing the balance by lifting the pole slightly if necessary. Once the balance is correct, lower the pole down and re-tighten the securing sling to take out any slack between the Sling 4A and the hook. To do this, pull up the free end of the securing sling to shorten the adjustable section.

It is MOST IMPORTANT that the securing strap is shortened to the correct length and a check is made to ensure that the buckle is secure before the pole is lifted other than to check the balance. Always use the end of the main securing sling, with the loop to attach to the Sling Lifting 4A. Never tie the free end (without a loop) onto the Sling Lifting 4A as this will slip through the main buckle.

The balance of the pole should only be changed when the pole is not supported by the Sling Lifting 4A, nominally horizontal and in a secure position. To change the balance of the pole from lifting to planting or vice versa, press the 'press to release' portion of the main buckle on the main securing strap, pull some slack through the buckle. Move the Sling Lifting 4A. Then, re-tighten the securing sling and ensure the buckle is secure. The Sling 10B must not be used to lift the pole on its own but must always be used on conjunction with a Sling 4A as the main lifting sling.

4 *Loading and Manoeuvring Poles*

The weights of various poles are in ISIS EPT/OHP/B058.

There are 4 absolute key requirements to ensure a safe activity.

- Vehicle positioning when loading/unloading
- Use of a Control Line
- Keep the pole/load as low as possible
- Role & Responsibility of the Second Person/Pole Handler

4.1 Removing Poles from the Stack

Dependent upon vehicle type, there are 3 methods employed in sliding/dragging wood poles from a stack prior to loading. The vehicles either have a Fixed Hook, Winch or no Winch. The methodology employed when sliding/dragging varies for each and detailed guidance on each is given in this document.

If there is any doubt as to the methodology to be followed for a particular vehicle type, consult your Manager.

Wherever possible, do not climb onto poles in the pole stack or stacked loose.

Do not attempt to lift poles from below the top layer of the stack. Always remove poles from above the one you want first.

Position the sling as described in Section 3.1. Where the pole has to be manually lifted to position the sling, lift the tip of the pole where possible. Ensure that there are sufficient people available to lift the pole end. If necessary use Lifter Pole Hand Type or suitable crow bar or digging bar to lift the pole end, and place a chock or support (digging bar or batten) under the pole to keep it in the raised position. An alternative, if one end of the pole is protruding from the stack, is to lift the end of the pole using the sling and crane, until a chock or support can be placed under the end. Lower the pole onto the support and move the sling. When positioning the sling DO NOT pass your hand(s) under the pole unless the pole is chocked in position and stable.

With the sling in position pick the pole up from the pole stack or pack in the normal manner - tip heavy.

Hollow poles should be lifted directly from the pack or delivery cradle using the correct slinging once the pole has been released from the pack. There should be no sliding/dragging of Hollow Poles.

When there is not sufficient space in front of the pole stack for manoeuvring the vehicle or it is not possible to attach a sling at the desired lifting point without climbing on other poles, a pole may be removed from the top of the stack by sliding it off in one of the following ways.

4.1.1 Dragging Poles with Units having a Fixed Hook

The crane should be aligned with the end of the pole stack. Lower and extend boom until hook can be attached to a reeved sling at the end of the required pole.

Ensure that no one is standing in the line of movement of the pole as it may release suddenly as it slides and overshoot.

Take the weight of the pole end, telescope the boom in or 'fold' the crane to drag pole from stack adjusting the height of the boom as necessary. It may be necessary to take a number of 'bites' to get the pole in the correct position. Ensure that the pole is stable before anyone approaches the pole to move the sling.

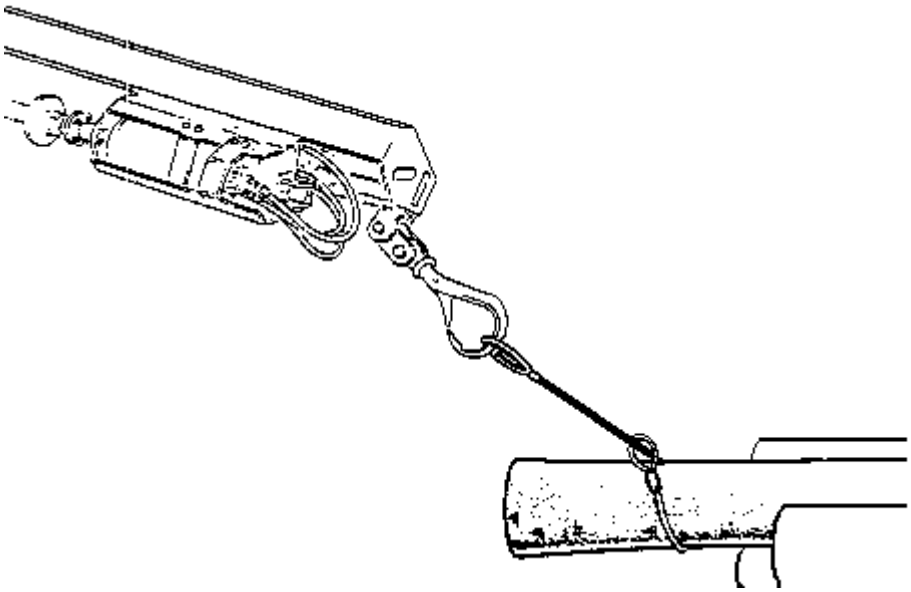


Figure 19 Sliding Poles off Stack without a Winch

If the crane is not possible the pole may be slid off using the slew of the crane. The unit should be parked so the pole is at the rear of the vehicle, but with the pole within reach of the crane. The sling and crane hook should be attached to the pole and the pole slid off the stack by careful rotation of the boom. **ENSURE** that the pole will not slide into the operator.

The slung end is then lowered to the ground while the other is still supported on the pole stack. Once the pole is stable the pole can then be approached and the sling moved to the tip-heavy balance point.

4.1.2 Dragging Poles with Units having Winches

If it is necessary to slide a pole off a pole stack, it may be pulled by the winch provided the vehicle is positioned so that the boom can be kept low and the boon must be in line with the winch rope. This technique should not be used unless there is a clear run for the winch cable over the boom end pulley.

It is not permissible to use the slew method outlined in Section 4.1.1 when using a winch; however, if the unit is also fitted with a fixed hook this may be used as described above.

The unit should be parked away from the pole, the sling and winch rope attached to the butt and the pole slid off the stack by carefully winching in to draw the pole towards the unit. All personnel, including the operator should be well clear of the line of movement of the pole while this is done as poles will overshoot the boom. The butt is then lowered to the ground while the tip is still supported on the pole stack. The pole can then be approached and the sling moved to the tip-heavy balance point.

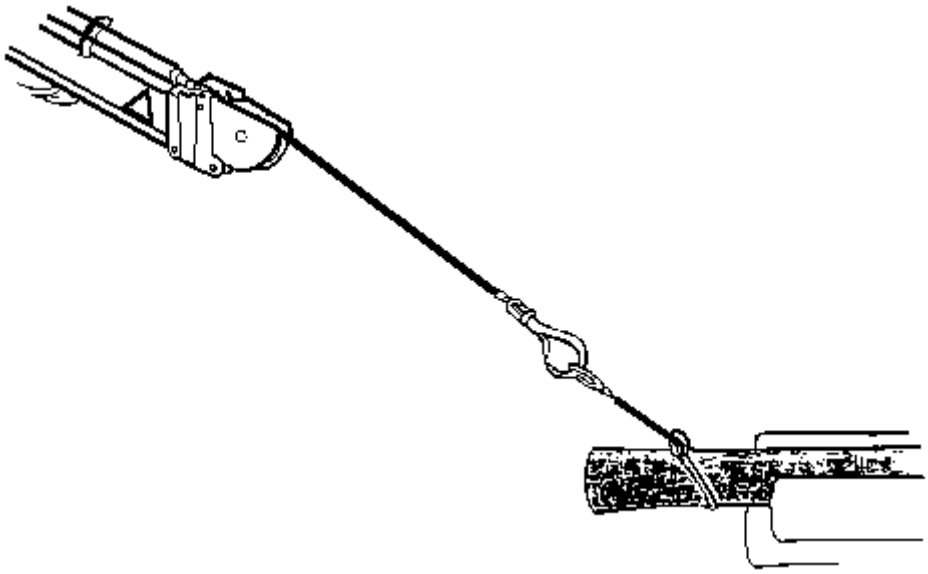


Figure 20 Sliding Poles off Stack with a Winch

4.2 Manoeuvring Poles

When manoeuvring poles they should be kept as low as possible and slightly tip heavy to enable control to be maintained. Remember if the pole is lifted high, it is less easy to control the position of the pole with the control line. The pole should be kept nearly horizontal with the tip slightly lower than the butt; only tilt the pole sufficiently to pass obstructions whilst keeping it as low as possible.

If it is necessary to pass the pole from one side of the crane or vehicle to the other, except as detailed below in Section 4.4, this should be done at the rear of the vehicle with the pole tip towards the front of the vehicle. When manoeuvring from the pole bay, the pole should be taken to the rear of the vehicle either directly from the pole bay by manoeuvring it to the rear of the vehicle inside the width of the vehicle, or by bringing it around from the side of the vehicle. (On some vehicles without a winch it is not possible to manoeuvre the pole to the rear of the vehicle within the width of the vehicle without lifting the pole to an unacceptably high level. In the case of these units you should bring the pole round from the side of the unit. If this is the case ensure your roadwork's guarding is adequate).

Remember you should not allow the pole to pass over the operator. The unit operator should adjust the extension of the boom until the pole tip clears the rear of the vehicle and the operator position/platform. The pole should be lowered until its tip is just above the ground and it should then be manoeuvred to bring the tip to the other side of the king post and the operator. The pole may then continue to be manoeuvred until it is in the position required.

If the pole is too long to be manoeuvred in this way or there is insufficient space behind the vehicle then, either

The pole should be on or off loaded from the side of the vehicle on which it is stored. If necessary the vehicle should then be turned round to continue with the operation;

Or

The pole should be off loaded tip heavy and place down prior to moving the sling to the butt heavy position. The pole may then be lifted to the near vertical position and manoeuvred around the back of the vehicle.

For units with cranes mounted just bend the cab, the pole may be manoeuvred over the vehicle body.

Use the same techniques for manoeuvring poles from the stack.

Poles must be handled with care, as they are liable to damage through being dropped, especially onto hard surfaces. Mishandling poles can cause fractures, de-lamination or shelling. This creates pockets inside the pole which when subject to a hammer test, demonstrate the same result as internal decay. As it is not possible to determine the extent of internal decay, all poles with this condition will be classified D.

4.3 Loading Poles onto the Unit

Load the poles on the vehicle in the reverse order to that which they will be required to reduce subsequent handling. Ensure the poles are evenly distributed.

There should be one lifting sling available for each pole and they should be left on the poles when loaded on the unit. The necessity to lift the pole manually to pass a sling under when it comes to unloading will then be avoided.

When loaded, the pole should always be stowed tip forward, and poles should be lowered tip first between the forward bolsters, with the butt then being guided down between the rear bolsters.

Poles must only be carried between the bolsters.

- Generally, new poles once dressed, **should not** be carried on the vehicle. Dressed poles can damage other poles, and present a safety hazard if fittings get tangled with ropes or other fittings. In very limited circumstances, it is permissible to transport a pre-dressed pole to site. If this is necessary, then the checklist shown in Appendix 1 must be completed by the Line Manager, and retained. All of the requirements of the checklist MUST be complied with. When this process is being followed, no other poles may be carried in the same bay, and a maximum of 2 dressed poles (1 per bay) is permitted.
- Recovered poles **MUST** be stripped of all fittings before loading onto the vehicle for subsequent transportation. The only exception would be where site access is limited and the Appendix 1 checklist process is being followed to

allow removal from site as an expedient. The pole must still be stripped of all fittings as soon as reasonably practical.

If loading very large poles lower the butt very carefully towards the bolsters and check that the pole will fit between the bolsters. If the pole will not fit on the unit, return it to the ground, ensure that it is stable and secured to prevent it being accidentally or deliberately rolled, and guard it. Report the matter to your manager.

The maximum number of poles that may be carried should be limited by:

- No poles should be above the bolsters (i.e. the centre line on the top pole must be below the tip of the lowest bolster retaining the pole).
- The sum of the weight of the poles and the unladen weight of the vehicle plus the weight of any stores carried shall not exceed the gross weight of the vehicle. Refer to vehicle plate and handbook. If in doubt have vehicle weighed with full complement of stores and tools. (Pole weights will be found in ISIS EPT/OHP/B058.)
- You should be within any limits for off centre loading as shown in the manufacturer's handbook (if any).
- Poles must be adequately secured.

When loading hollow poles, protect the outer coating from metal or sharp edges using sacking, wooden battens or lengths of plastic duct the battens or duct must be secure. If duct is used then duct 56, 100 or sub duct should be placed over the pole bolsters and slit or sectioned duct should be placed over the area on which the poles will rest.

Where the pole bolster is provided with a rubber bump strip to protect the poles, and it is in good condition, other hollow pole protection methods may not be required.

Do not mix hollow poles and wooden poles in the same bay.

Wherever possible, leave the control ropes attached to the poles and secure them to the vehicle in a suitable place.

4.3.1 Positioning of Poles on Units

The regulations governing the carrying and marking of overhanging loads during the day or night should be adhered to. For ease of reference, the requirements to be met for various amounts of overhanging pole are summarised in the example given in Table 1 below. This is for reference only and has been compiled using the length of one of the shortest PEUs and assumes that careful pole positioning has been achieved. Compliance with current regulations is essential. Check with the Drivers Handbook or BT Motor Transport for confirmation of current requirements as they relate to your unit.

Table 1

Size of Pole	Resulting Overhang		Make Rear Overhang Visible	Front End	Read End	Side	Attendant Reqd	Inf Po
	Front	**Rear**						
6m	None	0.5m	N/A	None	None	None	No	No
7m	None	0.8m	N/A	None	None	None	No	No
8m	1.2m	0.5m	N/A	None	None	None	No	No
8.5m	1.7m	0.5m	N/A	None	None	None	No	No
9m	1.9m	0.8m	N/A	None	None	None	No	No
9.5m	1.9m	1.4m	Yes	None	None	None	No	No
10m	1.9m	1.9m	Yes	None	None	None	No	No
11m	2.8m	1.9m	Yes	Yes	None	Yes (Front)	Yes	No
12m	3.0m	2.7m	N/A	Yes	Yes	Yes (Front)	Yes	No
13m	4.0m	2.8m	N/A	Yes	Yes	Yes (Front & Read)	Yes	Ye
14m	4.4m	3.4m	N/A	Yes	Yes	Yes (Front & Rear)	Yes	Ye
15m	5.0m	3.8m	N/A	Yes	Yes	Yes (Two Front & One Rear	Yes	Ye

Poles should be positioned so as to minimise overhang.

Check the height of the vehicle/load if poles which have been loaded extend above the normal transport height of the unit.

Special rules may apply locally, for example London - ensure you know these.

Note: The table above for information only based on the length of one of the shortest PEUs which is 6.37m (20'9") long - adjust the information for your own unit.

During transportation all poles must be secured in a safe manner (see below).

You must illuminate overhangs and signs at night in accordance with the Drivers Handbook.

When using knuckles cranes, it's sometimes not possible to position the pole in the ideal position to minimise the overhang. If this is the case the poles should not be swung or pulled to reduce the overhang, and the position of the sling should not be altered. The pole should be positioned in the best

possible position and appropriate methods used to mark or light any excessive overhang.

While any unit is on the road the crane jib must be in its storage cradle or it must be adequately secured to prevent the boom swinging.

4.3.2 Securing Poles

When loaded, poles must be securely lashed to the vehicle in a safe manner.

When loading both wooden and hollow poles onto the same vehicle, the poles should be separated to prevent the creosote of the wooden poles from staining the surface of the hollow poles. Wherever possible place the hollow poles on the outside of the vehicle.

Secure all poles using straps and tensioners using:

Tensioner 3B - Ratchet Tensioner for use with straps tensioning has short length of webbing attached with a snap hook to attach it to the securing eye on the vehicle

Strap Tensioning - A 3m long strap with a snap hook on one end 1A, 3m

Strap Tensioning - A 9m long strap with a D buckle on one end 2A, 9m

If necessary use a suitable shackle to attach the strap tensioning to a lashing point, or in the case of the Strap Tensioning 2A pass the strap through the lashing point on the vehicle and then loop the strap back through the D buckle.

Unsecured hollow poles, particularly the very smooth GRP ones, tend to vibrate off the PEU when it is stationary as do wood poles. Hollow poles can even slip through the lashings. All hollow poles should be secured with a Hooks Aerial Cable No 1 hooked under the butt or the cable entry holes and secured to the bolsters with a loop of Drawrope No 1. The same procedure is not necessary for wood poles, but they should not be left unsecured for longer than absolutely necessary as they can vibrate down the unit if left unsecured whilst the unit is running. If carrying hollow poles on a unit where the hollow poles are carried not sloping towards the tip then the poles should also be prevented from sliding forward through the lashing straps.

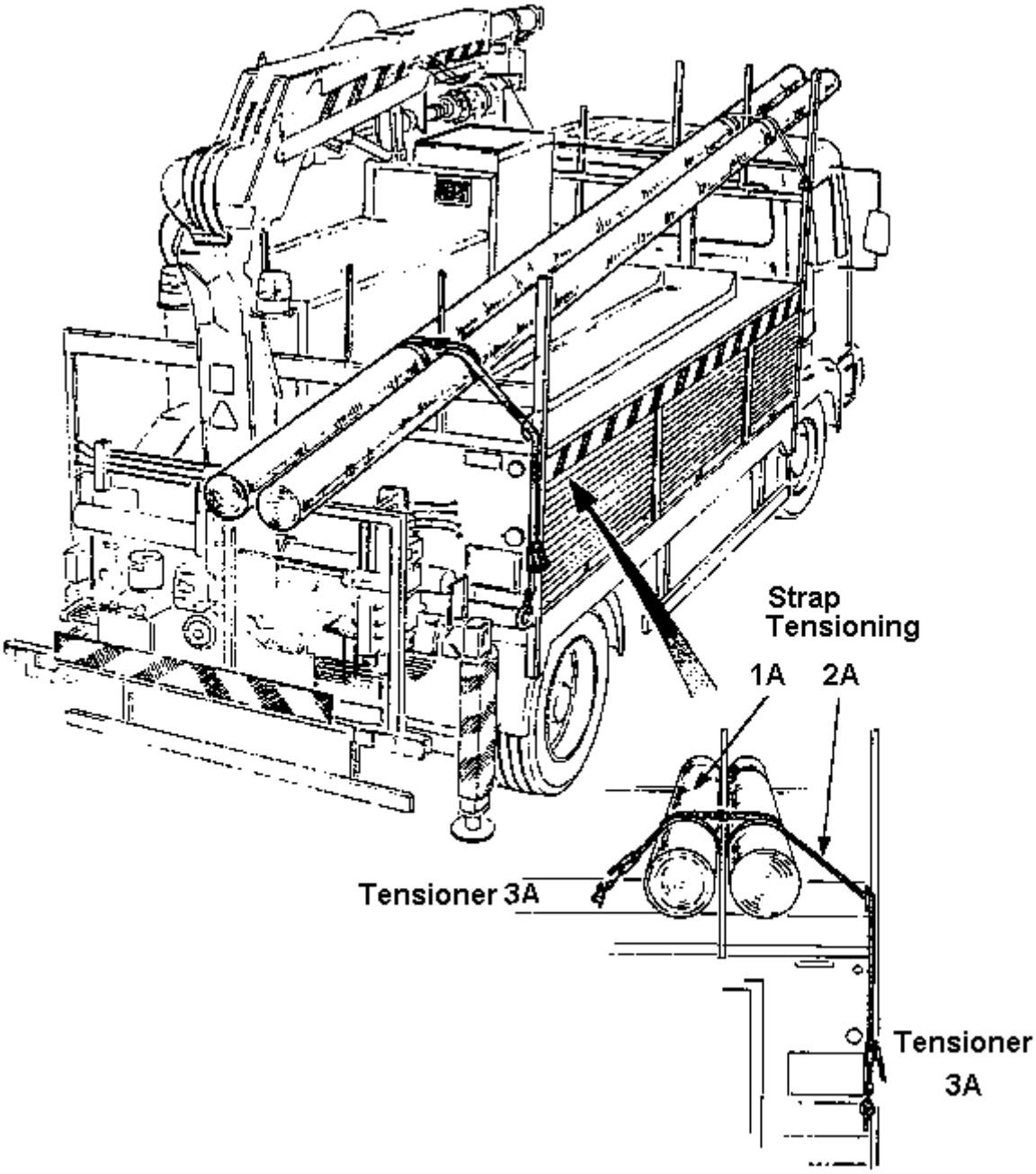


Figure 21 Securing Wood Poles

All poles must be secured using straps at the tip and at the butt.

Only use the correct lashing points for securing the poles; do not use the 'tarpaulin hooks' found down the sides of some vehicles.

Poles must be lashed so that there is no chance of them sliding off the vehicle under braking or acceleration. The lashing at the front of the unit should be placed over the top of all the poles using a single tensioner and suitable straps lashing.

The lashing at the rear of the unit should ensure that the poles are secured together by a turn around all the poles in each bay, and that the poles are pulled down onto the pole supports. Where there are three or more poles in one bay, it should be ensured that all poles are secured together so that poles cannot be 'loose' in the centre of the bay. This may mean having separate lashings for some poles in a bay.

The normal method of securing is as follows; this should be varied if necessary to ensure that all poles are adequately secured.

At the butt end of the poles always use tensioners, one attached to each of the lowest anchor rings on either side of the poles. The Straps Tensioning 1A and 2A should be hooked together and the ends passed once around the poles in a pole bay, through the upper guide rings on either side (where fitted) and down to the straps tensioning.

4.3.3 Alternative Method (for Wooden Poles Only)

The revised method detailed below, can be used for up to four poles only, and is for wooden poles only. All directions are given viewing the vehicle from the back.

A single Strap Tensioning 2A is used. It is fitted by using a shackle at the ring nearest the furthest left bolster (Shackle 12 - i/c 126411). The strap is passed over the top of the pole(s), then underneath and over again. It is then passed through the ring by the furthest right bolster, and fed into a Tensioner 3A, fitted at the usual point

The passing over and under of the strap can be done from either the platform of the vehicle, or from the ground at the back of the vehicle (This is the easier option). It is important to ensure that the strap is not twisted, and lays flat against the surface of the pole. See the attached Figs for detail of the strap positioning.

Ensure that the shackle, D ring and Strap are in line, and that the shackle is not caught under or askew on the fixing loop.

All shackles are subject to inspection under the e-YP process. Ensure that any new shackles are added to the appropriate kit list.

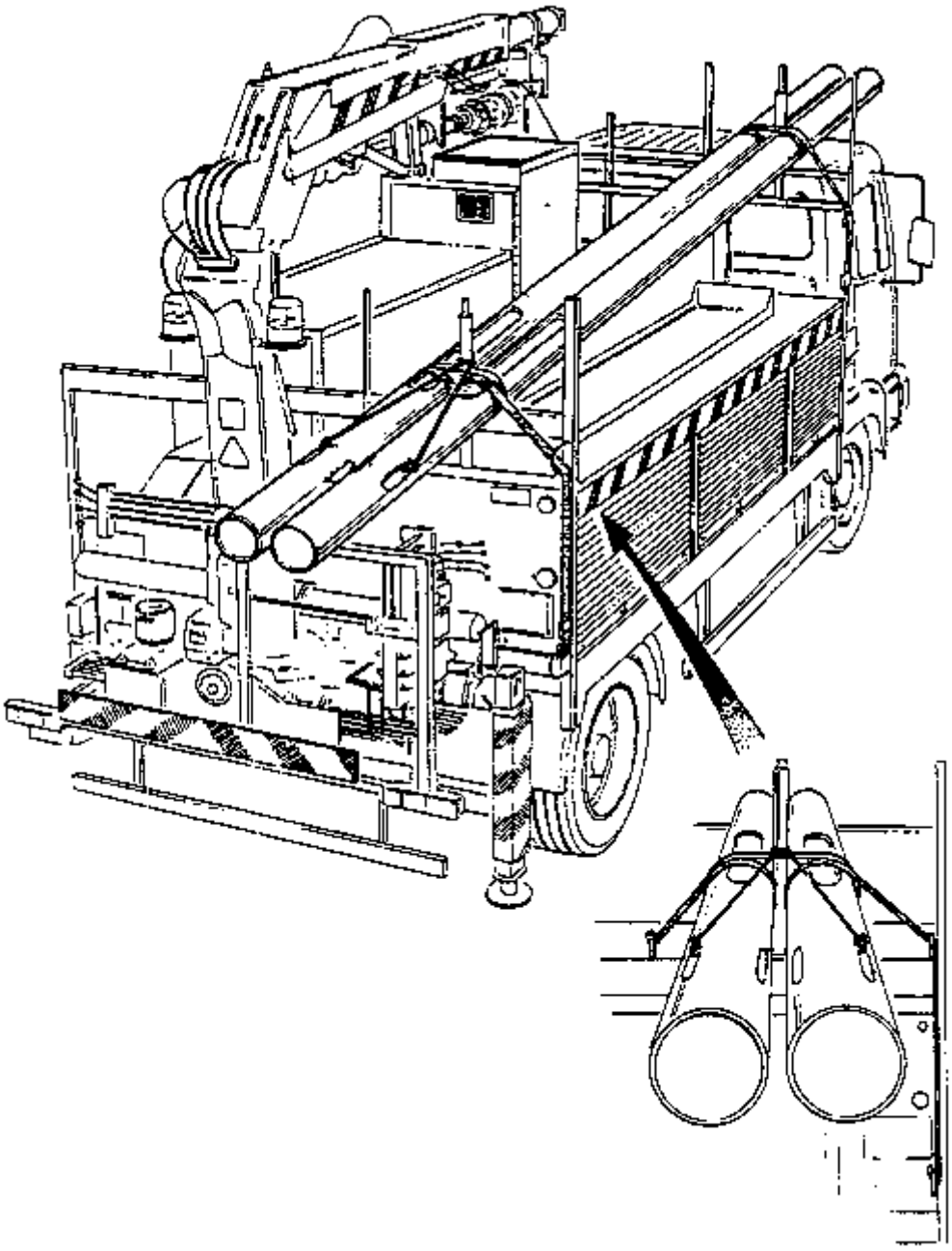


Figure 22 Securing Hollow Poles

If carrying hollow poles ensure that the joint between the Straps Tensioning does not rest on a hollow pole as this may cause damage to the poles, and if possible arrange the joint to be clear of wood poles to avoid damage to the snap hook or D ring on the straps. Where there are single poles in a bay they may be included with poles in an adjacent bay, providing all poles are secure (see Figure 24).

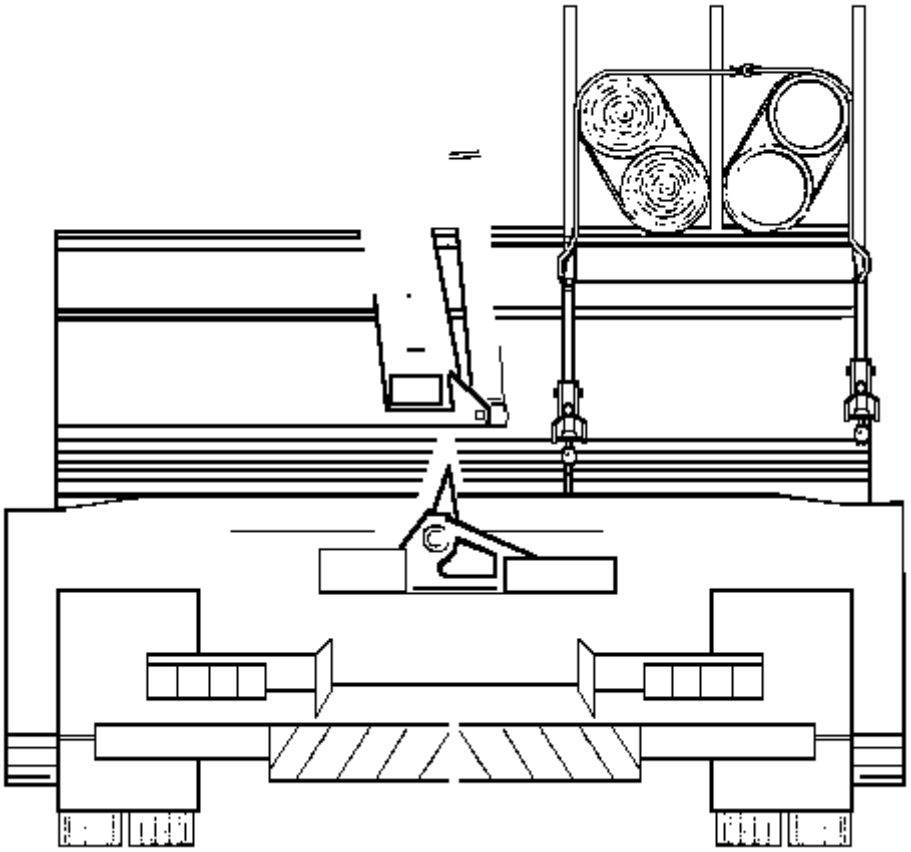


Figure 23 Securing Poles

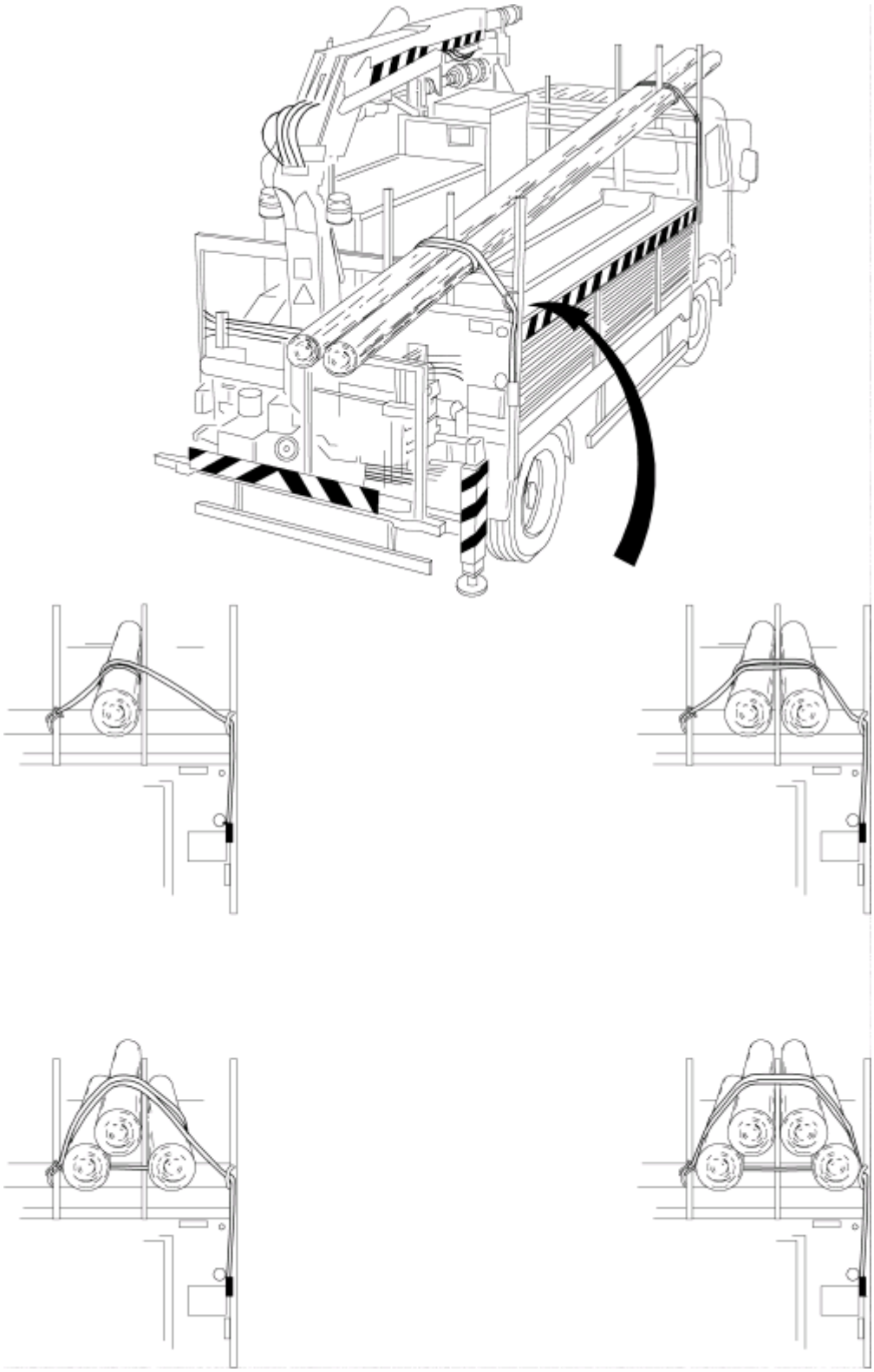


Figure 24 Securing Wooden poles - alternative method

The tensioners should then be tightened to ensure that the poles are secure.

No more than two groups of poles may be secured by one set of straps to ensure that all the poles are secured. If necessary use a second set of straps. (If one of straps is used to secure 3 sets of poles the tension may not transfer to the 'middle' set.)

If the vehicle crane is not in the manufacturer's stowage position, then it must be secured to prevent the crane slewing as the vehicle is travelling along the road.

Always check the retension the lashings after a short distance to ensure they have not come loose (the poles tend to 'bed' down and slacken the lashings).

Care should be taken to ensure that all loose ends of webbing are securely contained on the vehicle before driving off.

4.4 Unloading Poles from Vehicle

When this operation takes place at the roadside, great care should be taken to prevent the pole obstructing the flow of traffic. The pole must never be lifted over or into the path of traffic or manoeuvred such that the pole would fall outside of the guarded area if the butt or control rope was accidentally released.

When unloading poles at the road side, units carrying poles on the offside should wherever possible be positioned facing the oncoming traffic. Poles will then be on/off loaded on the offside of the unit directly into the working area on the footpath/verge or to the rear of the vehicle. If poling operations have to be carried out such that the unit needs to be parked facing with the traffic, then unless there is room to turn the pole horizontally at the rear of the unit, poles should be unloaded and loaded with the unit facing the traffic and the unit turned round. Where this is not possible the pole should be unloaded into a safe guarded area as close to the unit as possible and the pole reslung butt heavy to take the pole around the rear of the machine.

On stores carrier type units or other units carrying poles on the near side park with the traffic so poles can be on and off loaded on the side they are carried. In this case remember that your working area at the rear of the vehicle will be more exposed to approaching traffic. Ensure your guarding is adequate.

Before unloading, the vehicle stabilising jacks must be fully extended and lowered unless a slew limitation system is in operation.

Manoeuvre the crane hook over the sling on the pole. Attach the hook to the sling, and a steadying rope around the butt as previously described if not already fitted. (If lifting a hollow pole ensure that the hook under the door lintel has not come loose.)

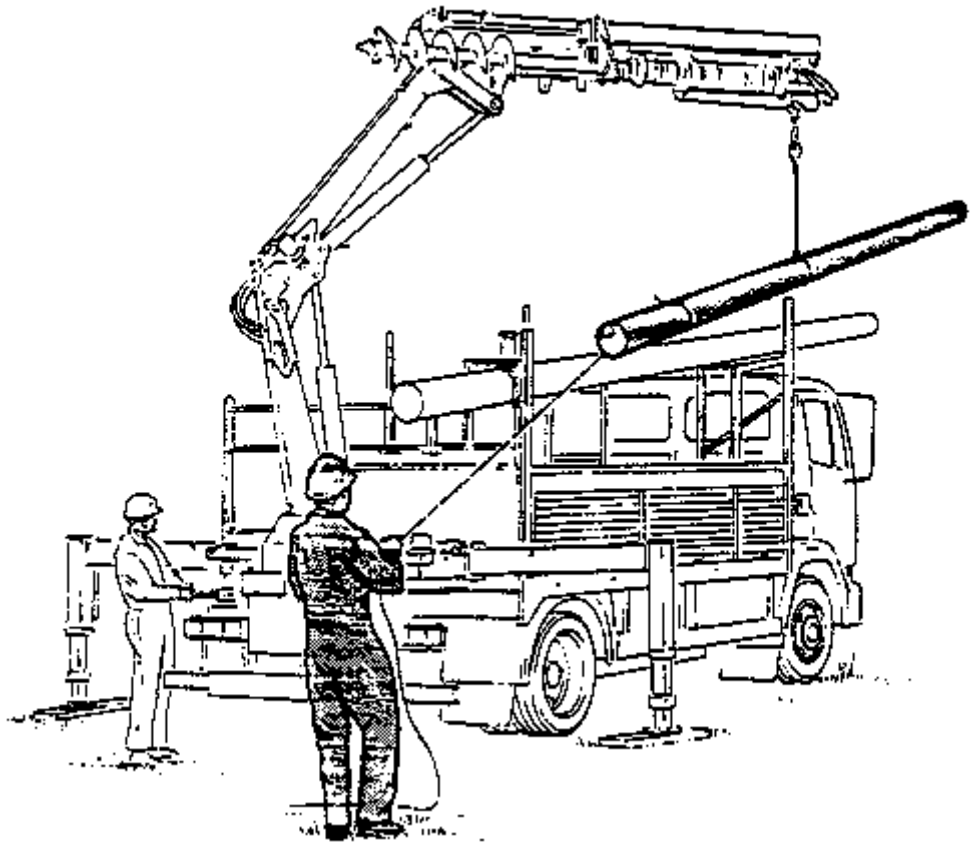


Figure 25 Unloading Poles

The safest position to set the pole down is normally immediately behind or alongside the vehicle on the footpath.

Lift the pole clear of the stanchions and lower the pole onto the pole horse for dressing, ensuring that the other poles do not move due to any vibration of the unit. Lift and lower the pole steadily controlling it with the steadying rope.

Always load and unload poles in order – DO NOT take shortcuts by trying to move poles from underneath others.

Once the pole to be installed has been removed from the vehicle and positioned on the pole horse, it is ESSENTIAL to secure the remaining poles prior to any further work. This is to prevent possible movement and slippage due to vibration caused when using the auger or other operations on the unit. Care must be taken when positioning the restraining straps, and avoid any unnecessary climbing, but it is safer to restrain the remaining poles as soon as the pole to be worked on has been removed. In many circumstances, especially in narrow country lanes, work can be interrupted by other traffic wishing to pass, and under no circumstances must a PEU be moved with unrestrained poles.

Dress the pole.

5 *Working in vicinity of HV power lines*

For some years there has been a “red Zone /Green Zone” process for MEWP work in the vicinity of High Voltage (HV) OH power lines. Following a review, it has been determined that this process should also apply to PEU working, due to the similarities between a MEWP boom arm and the PEU jib. This process is detailed below. Fig numbers below refer to Section 5 only

This is the safe method of working in close proximity to overhead HV power lines.

Consider the work site in plan view (see Fig 1). The 'Red Sector' is considered to be an area contained within the minimum safe distance from the power lines (e.g. 3m from 33KV lines). The safe sector is the ‘Green Sector'.

The optimum position for the PEU is such that the arc of operation is a 180º arc on the opposite side of the vehicle to the HV lines. If this is not possible, then particular care must be taken if the jib moves into the opposite arc, nearer to the HV lines.

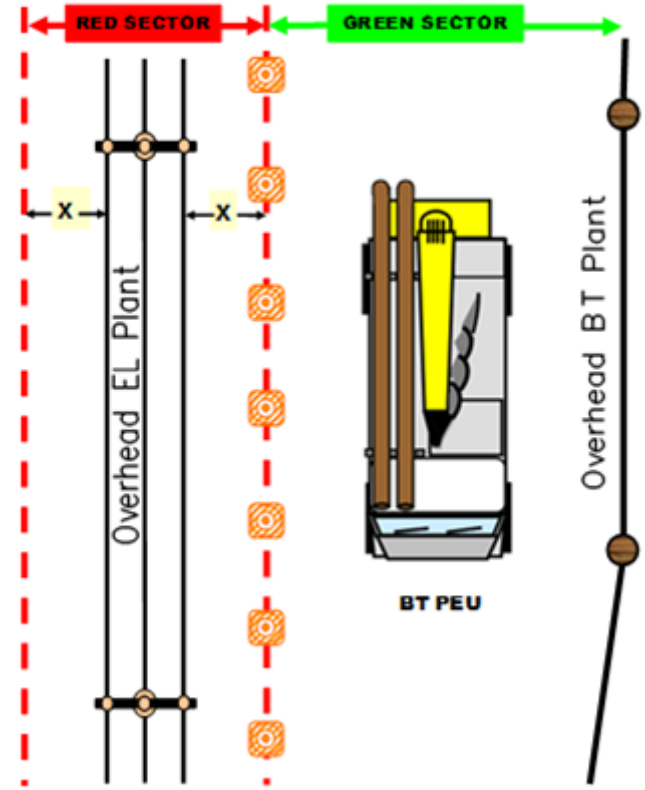
The cones marking the RED zone must be thought of as a vertical wall, extending upward beyond all points of reach. It is essential that no part of the PEU encroaches on the 'Red Sector', at ANY time during the work.

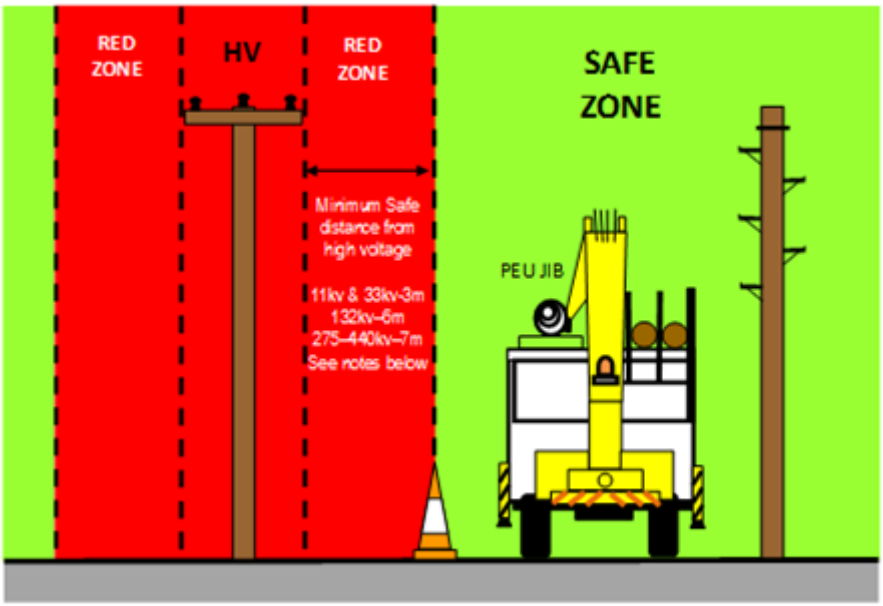
This **MUST** be monitored by the second working party member at all times when the jib is being moved.

Under no circumstances should any part of the PEU leave the “Green Sector”.

Before work commences, in addition to any required roadworks guarding, the operator and ground support person must also mark the line between the 'Red' and 'Green' sectors with road works guarding cones or road spray paint.

Alternative examples of worksites/road layouts, are shown in Figs 3 & 4 to show how the restricted Zone may look in those or similar circumstances





Figs 1&2 . Position of PEU with regard to Safe Sector working

The second working party member has an essential role to ensure the safety of the operative of the PEU and the impact of the operation on others. Where the Safe Sector Method is being used they must:

1. Be involved in the risk assessment

2. Ensure the parameters of jib movement are agreed and ground markers installed as required.
3. Be in attendance and in communication with the operative at all times that the jib is in motion and not leave the immediate vicinity whilst work is being undertaken aloft.
4. Whilst the jib is being moved the second working party member MUST visually monitor, guide, warn and direct the operative in relation to their position and proximity to the overhead power lines.
5. The second working party member will also act in line with instructions from the Line Manager when they are supervising the work.

In all cases where the work site is within 25m of HV lines, then it is also necessary to complete the written Risk Assessment, using pads “Risk & Hazards Worksite Assessment, working in the vicinity of power” **(itemcode 061461).** The completed on site risk assessment must be retained for 6 months for audit and inspection purposes.

Whenever Poling / PEU work is required to be undertaken within 25 metres of High Voltage power lines the PEU operator must determine whether the work can be undertaken safely and if not the job must not be started and instead be passed back to a manager to decide the way forward.

> **WARNING:** In all cases, the work MUST NOT be started where the pole or apparatus to be worked upon is closer than 3 metres to any high voltage equipment, or the work would result in people or equipment being closer than 3 metres to the high voltage equipment.

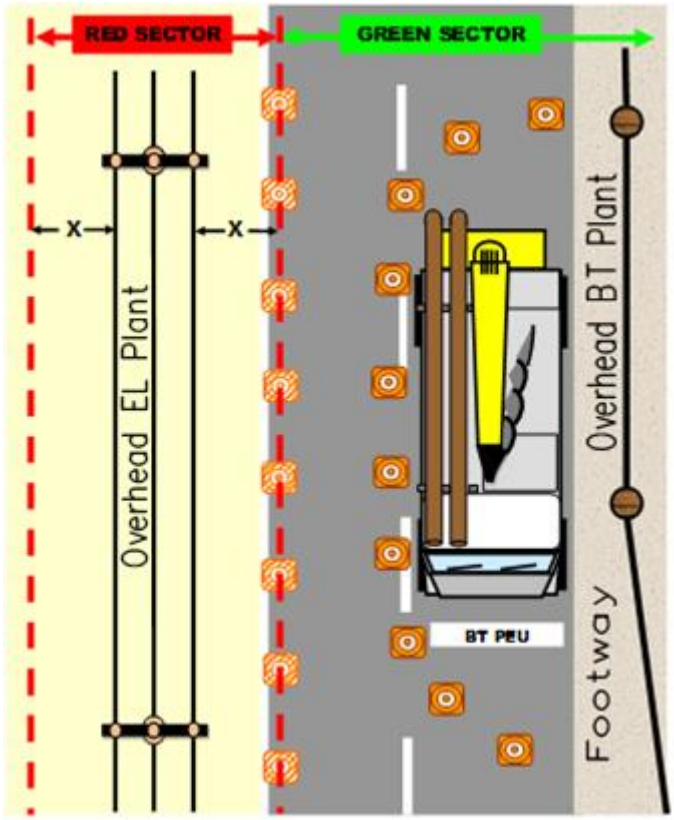
Alternative options the manager should consider include:

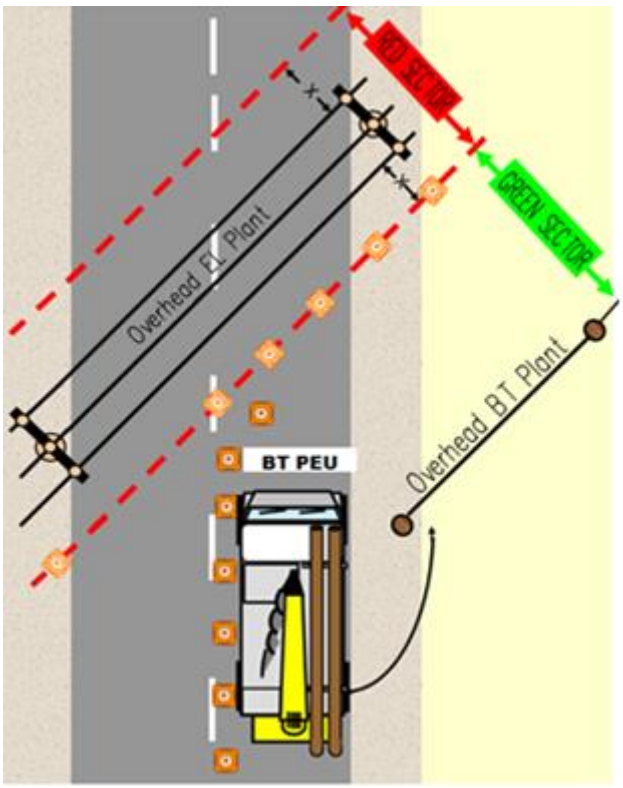
Using the “Limited Access Certificate” (LAC) process (contact Safety Direct for details of this new process)

Re-planning the work,

Asking the DNO to carry out the work or arranging for the power to be turned off.

If the decision is they can work safely with the lines powered, the operator must complete an on site power risk assessment to determine the position of the PEU and the order in which the work will be undertaken.





Figs 3&4. Alternative example positions of PEU with regard to Safe Sector working

6 *Pole Erection*

Units may only be used for pole erection where the reach and load capacity of the crane is sufficient to allow the crane to lift the pole at the reach required to place the pole in the pole hole.

For units not equipped with augers the pole hole should be prepared manually or with alternative machinery.

The units may be used to lift and support struts in position during the assembly of strutted poles. The pole to be strutted should be fully backfilled before the strut is erected. The strut should be positioned and guyed to prevent sideways movement before anyone ascends the main pole. If using an elevating platform for access the platform should be kept clear of the lifting operation until the strut is in position and stationary. The strut should then be attached to the pole. The strut and the crane should not be moved whilst anyone is on the main pole or an elevating platform is near the crane or pole.

6.1 Boring or Enlarging the Pole Hole

6.1.1 Digging

Prior to any boring operations ALL the requirements of Location of Services and Safe Digging must have been carried out and remember do not use an auger within 0.5m of a gas pipe and wherever possible avoid augering within 0.5m of any service (SFY/HSH/D057 refers).

If you are enlarging an existing hole, examine the hole to ensure that it is clear of pipes or cables before inserting the auger.

Position the auger and drill the pole hole using the appropriate crane and auger controls.

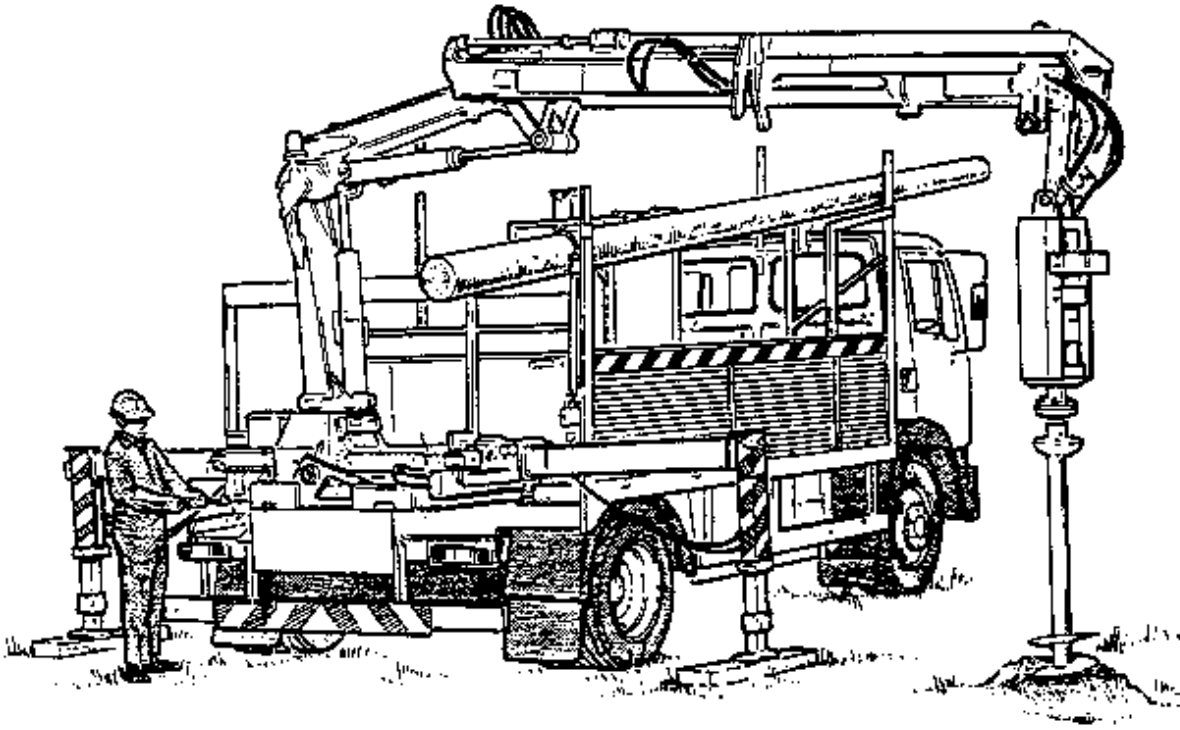


Figure 26 Augering

Staff must stand well clear of the auger whilst it is in motion in the ground. This means at least **3m** away.

During the boring operation, movement of the boom or auger mounting is required to keep the auger vertical. A second person should assist in this by watching the boom from a side position well clear of the auger and giving instructions as required.

Never overload the crane when boring the hole. Keep an eye on any safe working load indicator, and be careful the auger does not 'drive in' and overload the boom or pull the vehicle over.

If the engine revolutions are raised whilst boring, it should be remembered that this will make the operation of all other controls fiercer. Special care should therefore be taken to open and close control valves gently.

Ensure boring takes place well clear of the operator's position, that is **more than 3m away**. For 'standard' PEUs it is not possible to bore closer, but with types with a knuckle crane it is possible to bore right next to the operator, and should a power cable be struck, there is a danger of flash injury.

The auger must be clear of the hole, with its tip resting on the ground and stationary before the second operator clears off the earth. EARTH MUST NOT BE CLEARED FROM THE MOUTH OF THE POLE HOLE WHILST THE AUGER IS IN MOTION, AND YOU MUST NOT CLEAR EARTH FROM THE AUGER AS IT ROTATES. Several people have been

injured by the spade or clothing being caught by the auger whilst it is rotating.

If possible the auger should not be rotated in the reverse direction whilst in the ground as the security of fixture of the tooth inserts depends on a forward load and they can easily be lost if the auger is reversed.

Use a suitable tool to measure the depth of the pole hole, and remember that 1.2m is the absolute minimum depth for poles. They should often be set deeper, and in the case of DPs and allow hollow poles this means 1.5m.

Where poles are to be set in the same hole as a recovered pole there must be sufficient space to properly backfill around the pole to ensure the pole is firmly held. This will sometimes mean 'reaming' out the existing hole with the auger.

After boring, the bottom of the pole hole must be thoroughly punned before erecting the new pole.

6.2 Pole Erection

On wood poles attach the hook to a reeved sling approximately two thirds of the way up the pole, ensuring the pole is butt heavy. Attach a line to the eye of the sling to release the sling after the pole has been planted (see below). On hollow poles use the slinging practice described in Section 3.2, ensuring that the sling support hook under the door lintel is secured in place.

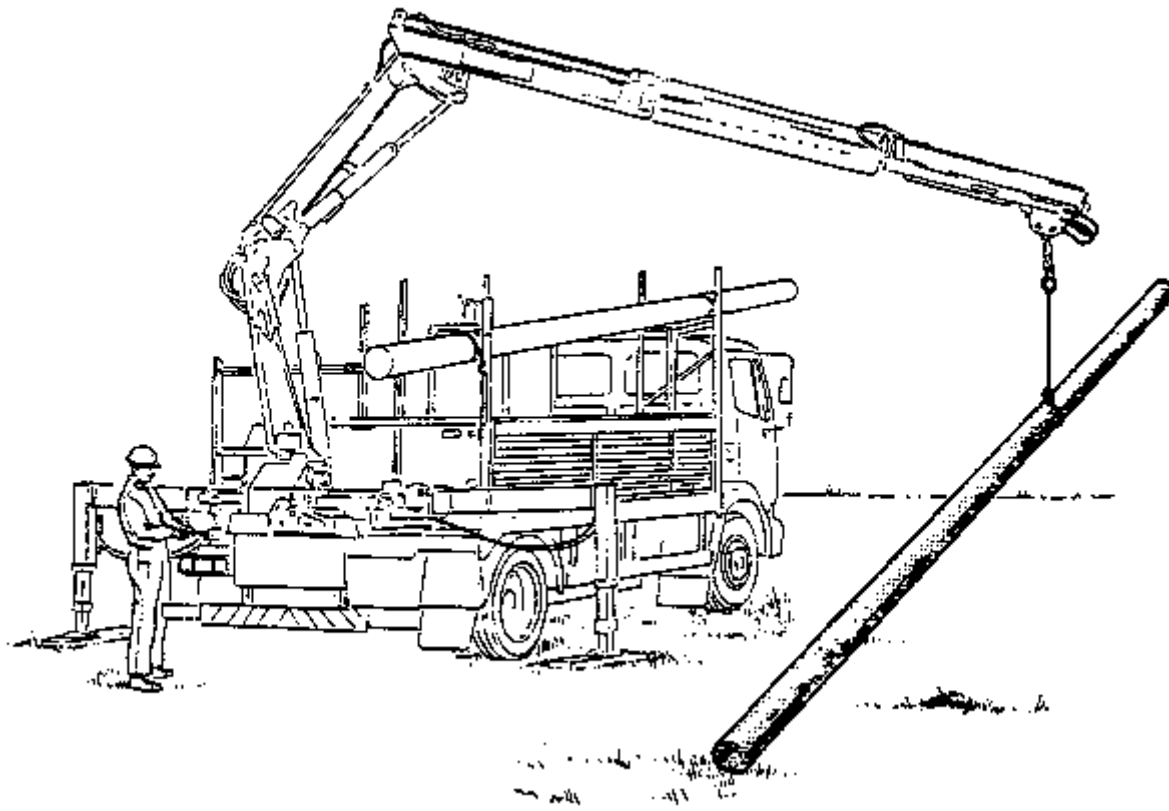


Figure 27 Lifting Pole Prior to Planting

Note: Drawings may omit detail such as pole steps and pole lashings for clarity.

Raise the pole, taking care to keep the sling vertical by rotation and elevation of the boom and operation of the extension as directed by the second person if necessary.

On lifting, the pole will take up a position 10/15° off vertical. It will however, be stable and the person guiding the pole will have no difficulty in controlling the butt to guide it into the pole hole. The butt of the pole must be kept as close to the ground as practicable during manoeuvre. Keep feet away from the area under the pole.

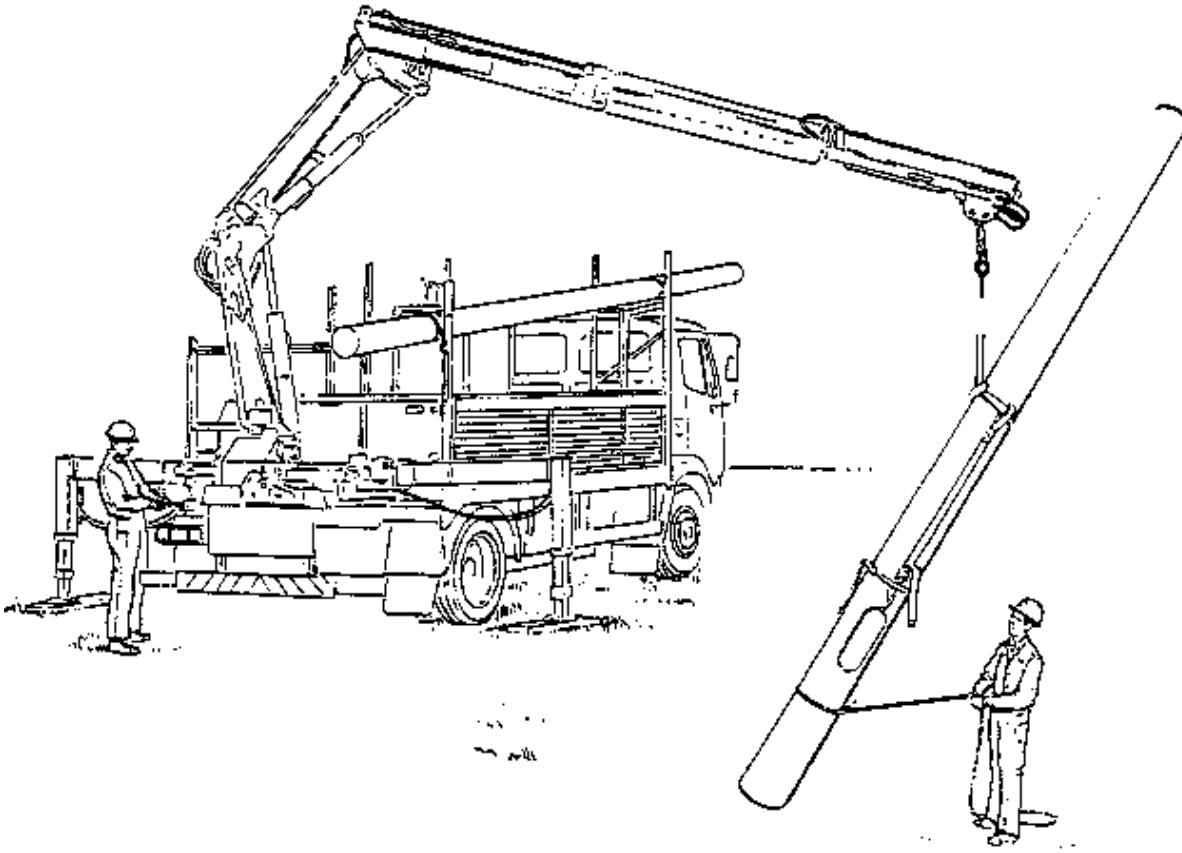


Figure 28 Lifting Hollow Pole Prior to Planting

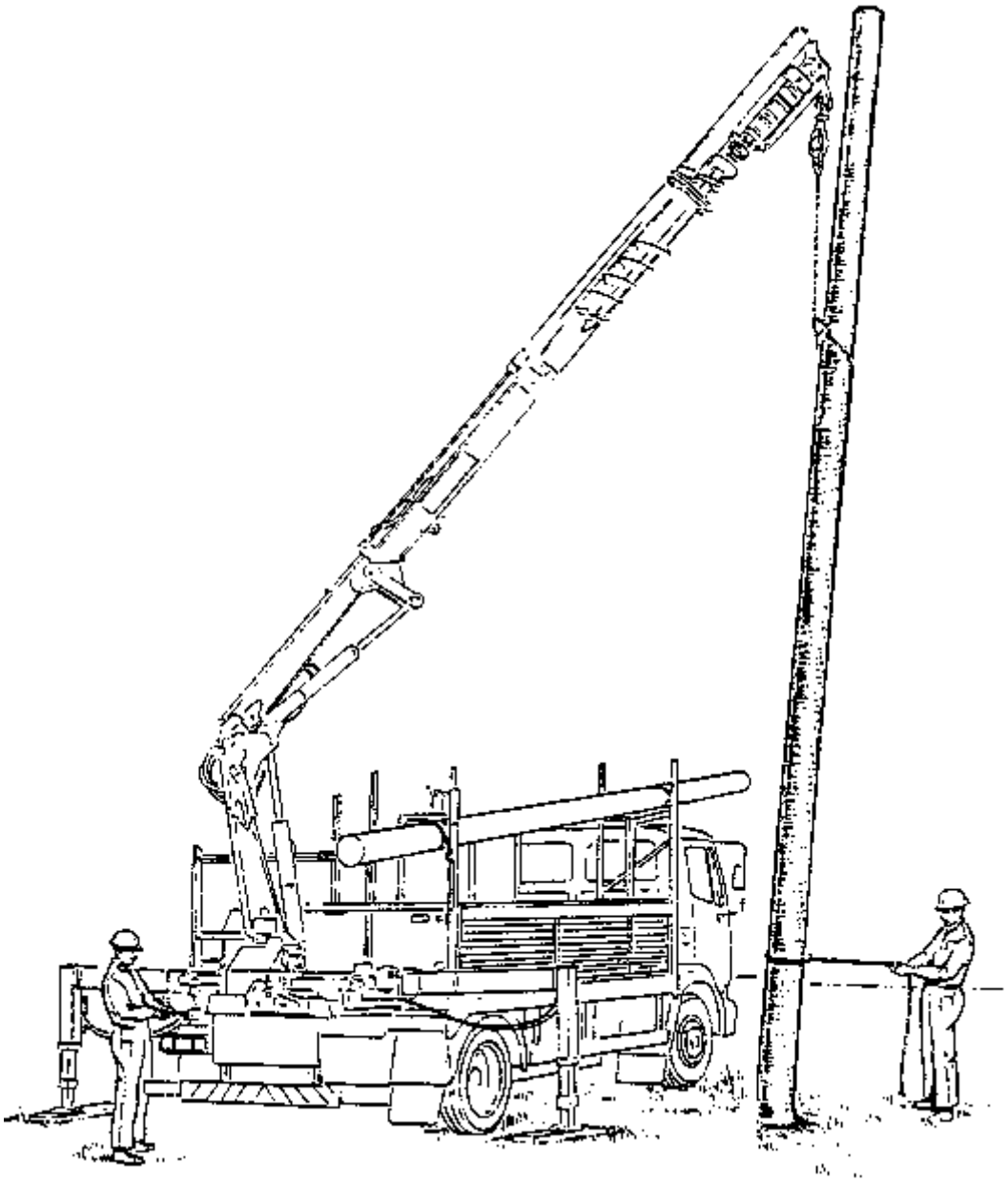


Figure 29 Planting Pole

Wherever possible make use of a control rope, but if the pole is guided by hand at any time the person guiding the pole must hold the pole at arms length, this will reduce the risk of injury should the pole suddenly drop. Ensure that the control rope is far enough up the pole to be clear of the pole hole - if necessary adjust the position.

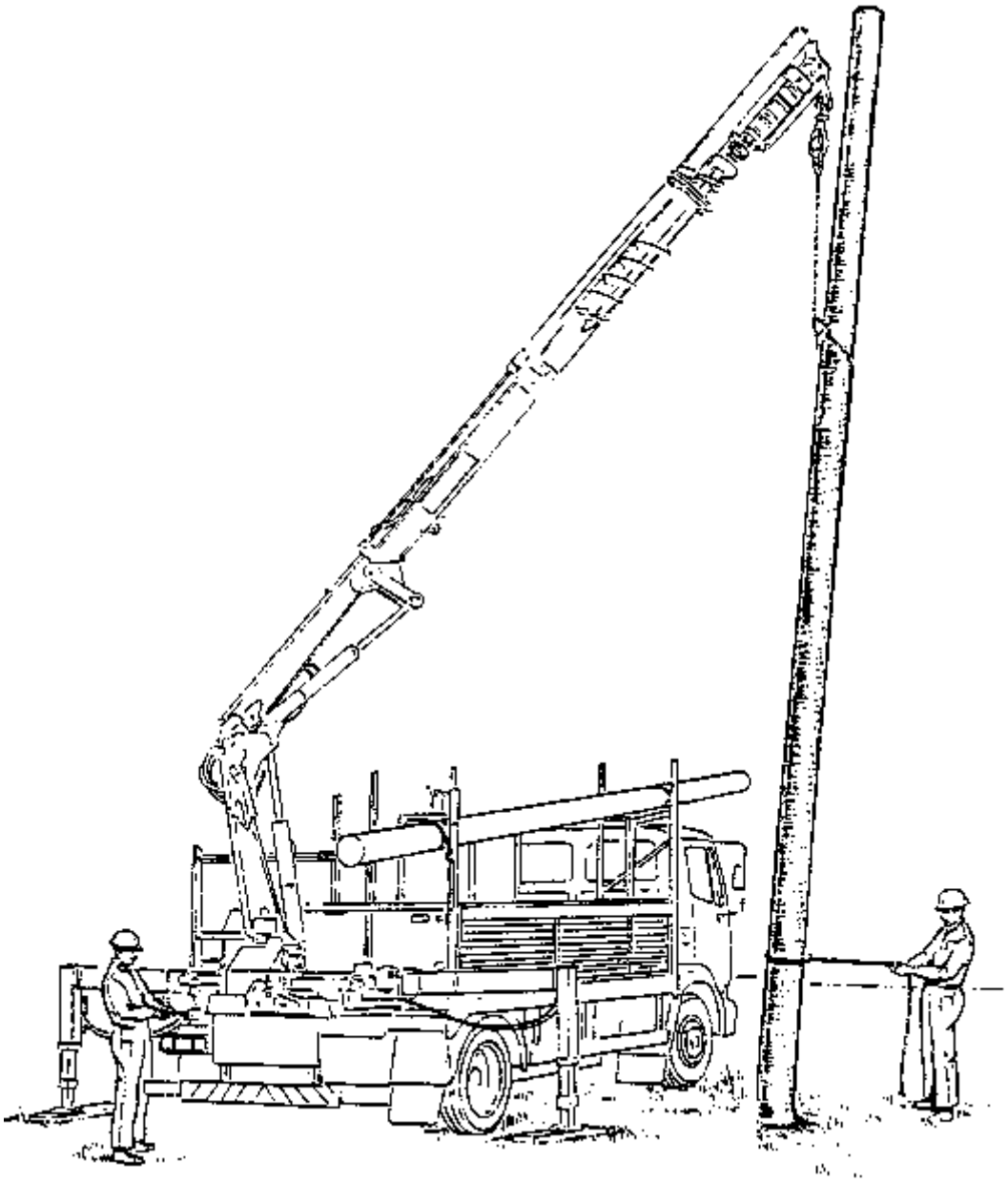


Figure 30 Planting Pole

Where the unit is fitted with a pole claw then the pole may be guided into the pole claw.

Set the pole in the pole hole.

When the pole is set vertically in the bottom of the hole, it should be held in this position by the unit, keeping the sling taught. The pole should be aligned correctly using the boom and the hole backfilled. If a steady arm on top of the jib or pole claw is fitted, use should be made of this as well. If necessary backfill slightly and then adjust the position of the pole using the crane/pole steady.

Do not forget to put the 3m mark where it can easily be seen; rotate the pole if necessary.

Backfill in well compacted layers with the material (earth) removed from the hole as normal that is replacing the layers as closely as possible to the way they were removed. Excavated material should be re-used except for:

Particles greater than 37.5mm nominal size

Materials that are wet and will not be able to adequately compacted

If the material removed cannot be replaced for any reason, match the existing ground as closely as possible. Where an imported material is required use the BT approved backfill material Limestone Clean 3/4 x 3/8in

The use of this material should be only as a final option, and placed in a 100mm layer only as the surround to pole directly under the final surface course

DO NOT remove the lifting sling until the pole is stable.

Having erected the pole, the sling can be recovered by allowing the sling to slide down the pole. If difficulty is experienced, one of three following methods may be used for wood poles:

- Method 1 Prior to lifting a pole, a sash line should be attached to the sling eye that is reeved; the sling can then be pulled free of the pole once the erection is completed.
- Method 2 Having erected the backfilled the pole the sling can be recovered by ascending the pole and releasing it by hand. (NOT HOLLOW POLES).
- Method 3 Use a socket tool, wire stringing and rods pruning to loosen and retrieve the sling.

For hollow poles the securing sling should be used to pull the lifting sling loose, however if problems are experienced use Method 3 above. Remember you must NOT climb hollow poles.

7 *Pole Recovery*

7.1 Recovery

Never recover poles with the boom and/or winch only as this practice will damage the machine. Never use the crane to shake the pole. Use a hydraulic or manual jack to lift the pole out of the ground. The boom and winch should only be used to steady the pole as it is being jacked out of the ground.

Strutted poles should never be recovered as one unit. All tie bolts and other attachments between the pole and strut should be removed before attempting recovery. If one item is decayed recover the decayed item first. If both items

are decayed recover the strut first, additionally supporting the pole during this operation as necessary.

7.1.1 Removal of Wires and Cables

Never attempt to remove or add wires or cables from a pole unless you are trained in the appropriate practice.

Pole should not be recovered unless all cables and wires have been removed from the pole (possibly to a new pole erected alongside the old pole) or disconnected from the end away from the pole, cut at ground level and taped to the pole. This should be carried out as trained and documented, supporting the pole as necessary.

Remember:

- You should always provide a temporary termination to hold the tension before cutting cable or wire.
- You should always reduce the tension gradually without jerks.
- You should always release wire or cable tension from a pole - NEVER from a house bracket.
- Always release tensions in a balanced way to ensure that any imbalance will be taken by a stay or strut, fitting temporary stays if necessary.
- If removing a cable from a pole temporarily by lowering the cable, you must ensure that undue strain will not be placed on the rest of the route and that staying is adequate to prevent increased dip on cables on road crossings. If in doubt fit temporary stays.
- Any crane used (for example, PEU) must only be used to support vertical loads.
- To enable the block terminal and feed cable to be recovered from the pole, it will be necessary to release the tension on the sling slightly. If you are supporting a 'D' Pole with the crane, this should be done after the block terminal has been detached but before the wires/cables are removed. This will allow the cable and block terminal to be passed down through the sling and lowered to the ground; the sling should then be re-tensioned to ensure the pole is secured whilst removing the cables/wires.
- When releasing a terminated aerial cable the pension must be maintained along the remainder of the route by securing the cable at the previous pole; a temporary stay may need to be fitted to maintain stability.
- In the case of through cables, route tension can be maintained by securing the cable at the pole on either side of the one being recovered. Failure to maintain route tension could result in the cable sagging below the minimum at a road clearance further down the route.

- After a DP has been recovered, any section of cable from the cable duct to just above ground level should be carefully inspected for damage. If the cable sheath is damaged to the extent of exposing the core or there is any doubt that it will not withstand the penetration of water, then the cable must be replaced.
- Before erecting the new pole, the side of the pole hole where the cable runs should be dug away by hand, so that the cable can be kept well clear whilst the new pole is being placed in the hole or the hole is being enlarged.
- It may be necessary to run the PEU auger down the pole hole to enlarge it or to remove any soil that may have fallen in during the recovery of the Pole. After boring, the bottom of the pole hole must be thoroughly punned before erecting the new pole.

7.1.2 Recovery Loadings

Care must be taken when recovering poles that the weight of the pole does not exceed the lifting capacity of the crane at the outreach being used.

If care is not taken as the pole is lifted free after the jack has extracted the pole, the crane will either sense an overload and prevent further lifting or if overload sensing is not fitted, the unit will be overloaded with the possibility of damage to the vehicle and injury to people in the vicinity of the fault. The approximate weights of poles are given in ISIS EPT/OHP/B058, but an allowance must be made for fittings and attached earth, blocks or concrete etcetera.

7.1.3 Dealing with 'D'efective Poles

'D' poles must not be climbed unless they are supported by a BT approved and documented method in which you are trained. 'D' poles which are only additionally supported by the crane of a PEU or other unit must not be climbed.

When recovering wires (including Suspension wires) or cables from 'D'efective poles remember:

- Always additionally support the pole with the crane wherever possible, but remember the crane is only designed to take vertical loadings. IT IS NOT designed to take side loading that is cable loads. If the pole cannot be supported with the crane, unless the pole is assessed by a competent person as being of sufficient strength to accept the changes in load, temporary stays or support from a new pole should be fitted as necessary to avoid the pole falling if it should break under any imbalance in the cables being removed.
- You must release the tension of each wire and/or cable on the pole, gradually from the ends of the spans distant from the pole while maintaining equal tension on each side of the pole until the tension has been released.

- Where this is not possible (for example dropwires leading from a DP to houses or a single span of aerial cable leading away from the pole) then the pole should be supported by the crane with the sling above the point of balance of the above ground portion of the pole. Wires may then be released carefully and evenly from a Platform Elevating or other support keeping imbalance to a minimum. Wherever possible secure the lower part of the 'D' pole either to any pole which has been inserted next to the old one, or to some other suitable support to prevent the pole overturning if it breaks. Great care must be taken not to increase the load on the pole as the load is taken on the temporary termination prior to releasing or cutting the cable/wire. **NEVER** support the pole or wires on a platform elevating.

7.1.4 Dealing with Broken Poles

Where broken poles have to be replaced and the broken pole top is suspended by the wires and the wires or cables CANNOT be released from the far end, one of two methods may be employed:

1. Where the pole is to be replaced, recover the broken butt with the pole jack and/or digging as necessary. Ensure during this operation that the upper broken section of pole does not present a hazard to anyone. Install the new pole. Ensure that the broken section is sufficiently stable not to be a hazard to the person installing a sling. Place the sling as high as possible on the broken pole top section and support it. (See Section 7.3 or use a platform to position the sling). Lift the broken section until it is adjacent to the new pole and then remove the transfer the wires to the new pole. During this process it is important that the pole is treated as a 'D' pole, and especially that the wire tensions are relaxed evenly and gently. If the section shows any sign of becoming unstable, stop and stabilise the situation. If appropriate, secure the bottom of the broken pole to the new pole, ensuring there is no hazard to any person climbing the new pole. Ensure that when you have finished transferring the wires, any securing rope or strop on the bottom of the broken section is removed before lifting the section clear and loading it on the vehicle in the normal manner.
2. Support the top section of the broken pole as above in a position to minimise the loading on the cables and remove sufficient wires and cables to enable to pole to be lowered to the ground for removal of the other cables. This operation must be carried out with the tensions being gently reduced and great care that the pole does not become unstable.

7.2 Use of Pole Jacks

As described before, great care must be taken over cleanliness when connecting and disconnecting hydraulic jacks.

Two types of jack are currently available for use when recovering poles, manual, and hydraulic. If new types are issued, follow the instructions supplied with the jack.

7.2.1 Use of Manual Pole Jack

The manual pole jack may be used where a hydraulic take off does not exist on the vehicle.

The manual pole jack is to be used in conjunction with Bases Joist, Chains Jack Pole and Bar Operating Large.

Place the Bases, Joist at the foot of the pole under the boom of the crane where possible, and erect the manual jack on the base. Pass the chain around the pole and reeve the chain before placing a link through the fork of the jack. The jack is operated by ensuring that the direction lever is set correctly (up for upward movement, down for downward movement) and using the Bar Operating Large in one of the spigots on the ratchet mechanism.

The body of the jack can be allowed to pivot around the foot by releasing the catch at the bottom of the jack.

Carry the jack using the handles provided.

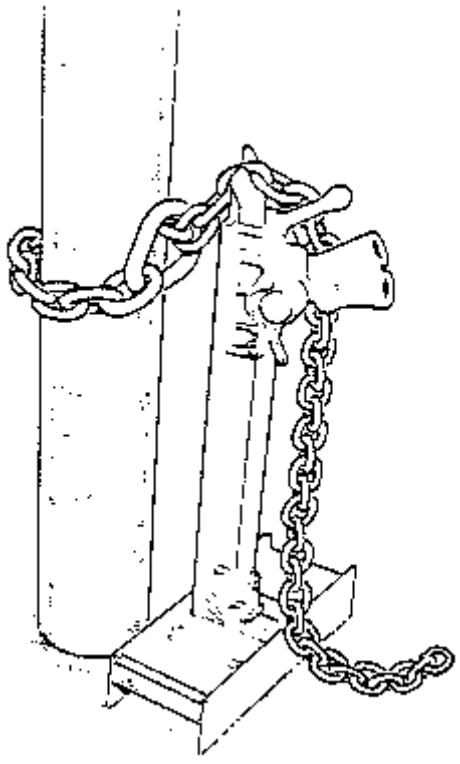


Figure 31 Manual Pole Jack

7.2.2 Use of Hydraulic Pole Jacks

The hydraulic pole jack is to be used in conjunction with a supplied base plate, chain and hydraulic hoses.

Place the jack base in position at the foot of the pole under the boom of the crane where possible with the cut-out (where there is one) against the pole. The method of attachment depends on the jack. For the jacks shown in Figure 32 and 33, put the hydraulic pole jack on the base and attach the chain around the pole as shown. When fitting the chain on the jack shown in Figure 32, place the large ring over the pole jack fork and pull the chain tightly around the pole before placing a link through the fork. If the chain is reeved in the manner used for manual pole jacks, it will bear against the ram of the jack when extended and cause serious damage.

The jack base on some jacks may be used flat side down where damage to the surface needs to be minimised, and ribbed side down where the surface is slippery and extra grip is required.

The unit operator should release all operating levers, and it should be ensured that the pole jack is not creeping before the other operator adjusts the chain/jack position.

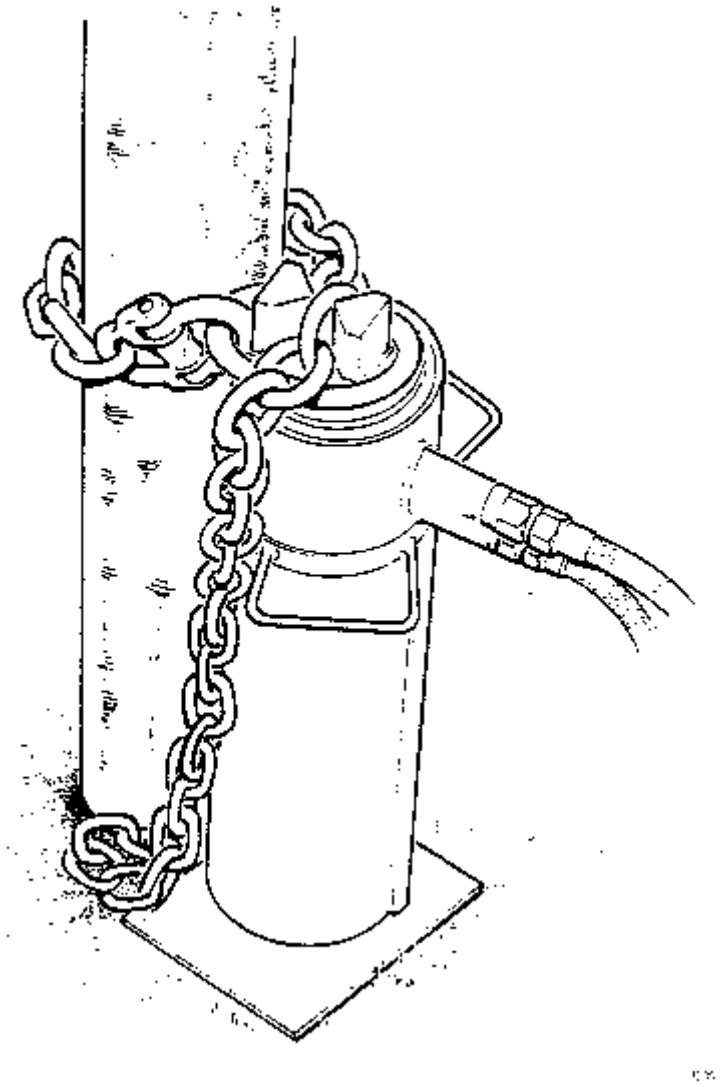


Figure 32 Hydraulic Jack Type 1

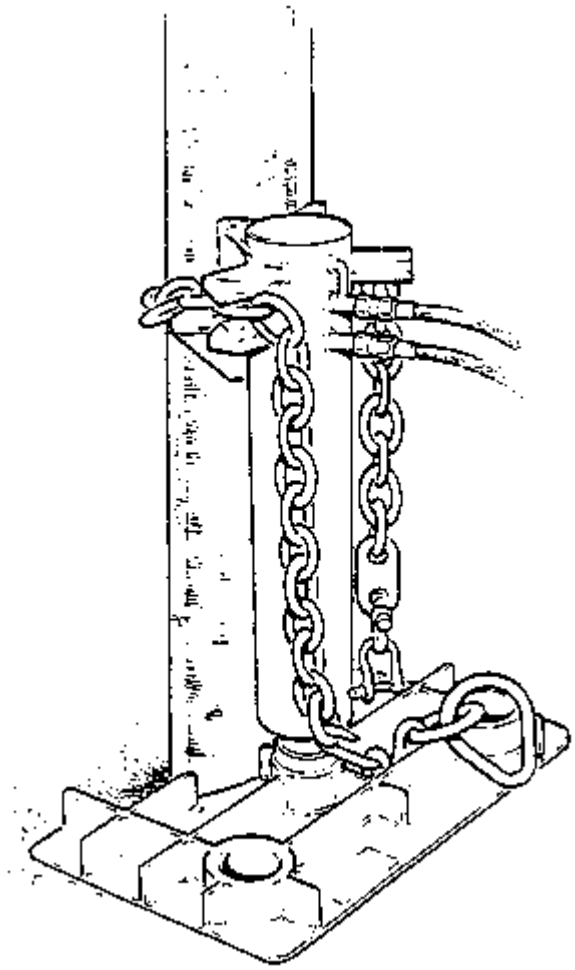


Figure 33 Hydraulic Jack Type 2

Connect the hydraulic hoses to the hydraulic power take off points on the vehicle and to the hydraulic pole jack.

7.3 Setting up

For wood poles the jack should be set up as described above, against the pole and preferably under the tip of the boom. The pole must be supported during jacking by the crane, using a sling which should normally be fitted at a point about 2/3 up the pole.

This sling should be fitted by reeving it around the pole and attaching the free eye to the crane hook which should be placed at the side of the pole relative to the crane operator. The jib of the crane should then be raised or the winch wound in whilst the sling is pushed up the pole to the correct height using socket tool wire stringing and rods pruning or other similar implement. DO NOT use your HANDS. Care should be taken to keep the hook close to the pole without hitting the pole; this is especially important when recovering 'D' poles.

Check you have sufficient movement of the boom or winch to lift the pole clear of the ground, and ensure that the sling is sufficiently high to make the pole butt heavy (particularly if the pole is badly decayed at the ground line and may fail during recovery leaving it butt light).

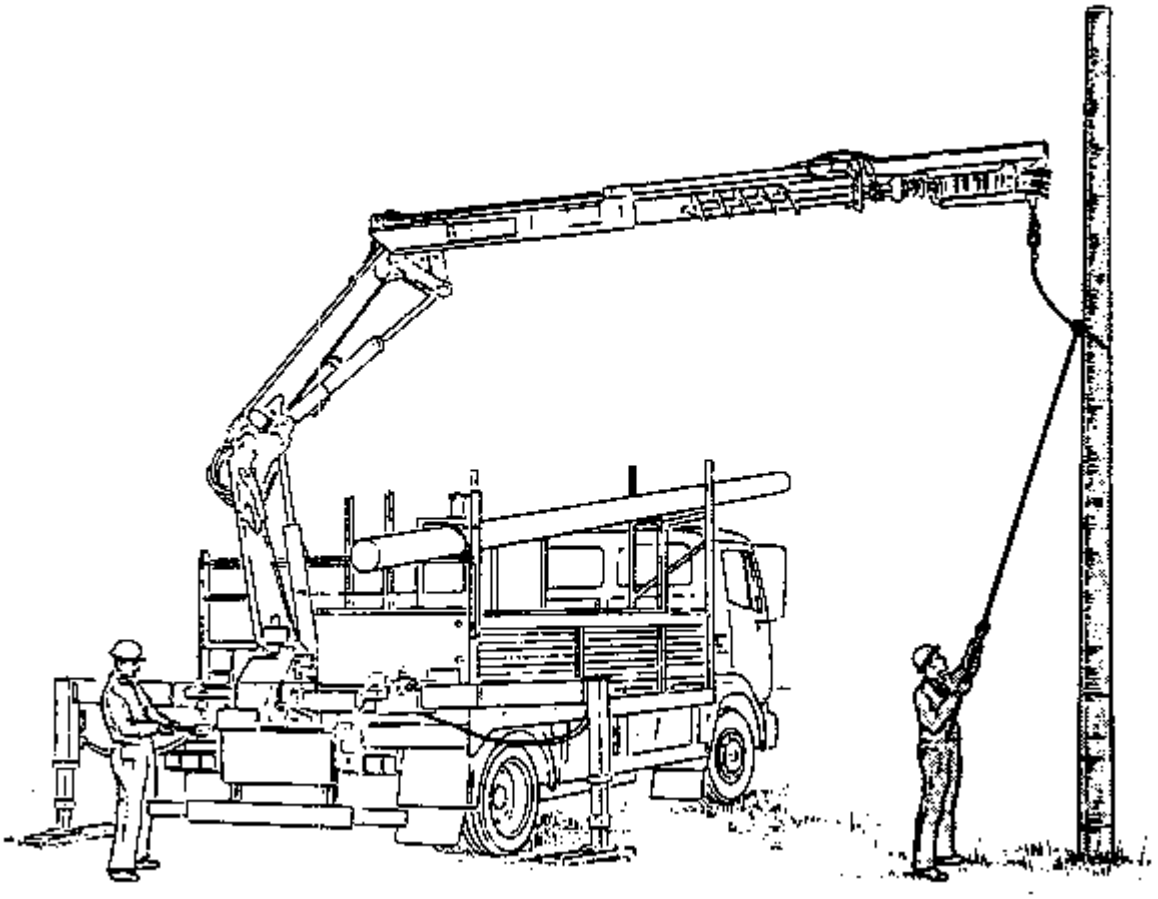


Figure 34 Positioning Sling on Pole

7.3.1 Special Techniques for Hollow Poles

When recovering hollow poles, the jack chain will damage the surface of the pole and will slip up the pole if efforts are not made to prevent it. Four or five wooden battens should be placed around the base of the pole if it is required to prevent damage to the outer coating or if it is necessary to provide extra purchase for the pole jack chain. If the batten slides up the pole they may be clamped onto the pole using an old Tensioner 1A and Straps Tensioning. This will often be sufficient to enable the pole jack to grip. If jack chain continues to slip use the method described below. (Battens should be joined by lengths of webbing strapping to make it easier to insert them correctly behind the chain.)

If the methods described above cannot be used because the chain continues to slip up the pole then use the following method with a recovery jig (see Figure 35). Place the top of the jig into the doorway so that it rests against the lintel. Tie the centre of the jig rope to the eyes of a lifting sling. Reeve the sling around the pole, attach the winch rope and raise to the required height. Pull down on the two ends of the jig rope and tie them off around the pole. Place wooden battens around the pole and attach the pole jack using the applicable procedure from this section. After the second lift, the extension flap on the jig can be lowered.

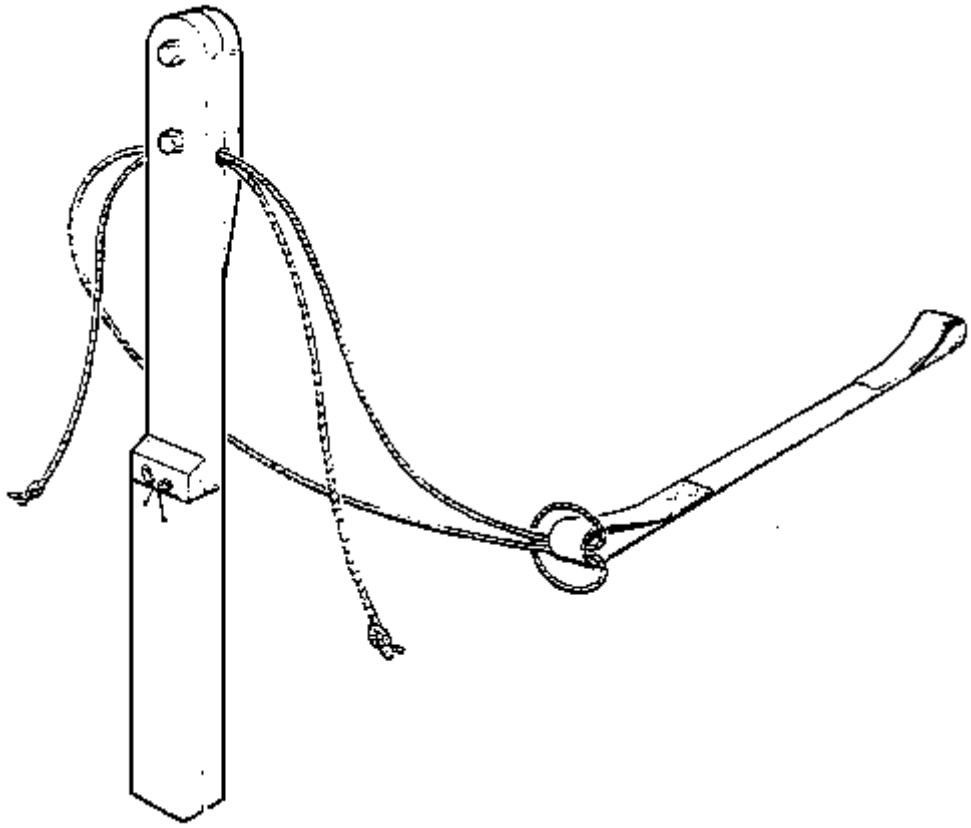


Figure 35 Hollow Pole Jacking Jig

Where the Sling Lifting 10B is to be used, the jig should be modified locally to suit by removing the drawrope and making a cut out in the jig at the top to enable the securing hook of the sling 10B to be fitted.

These figures are shown on drawing CN 306.

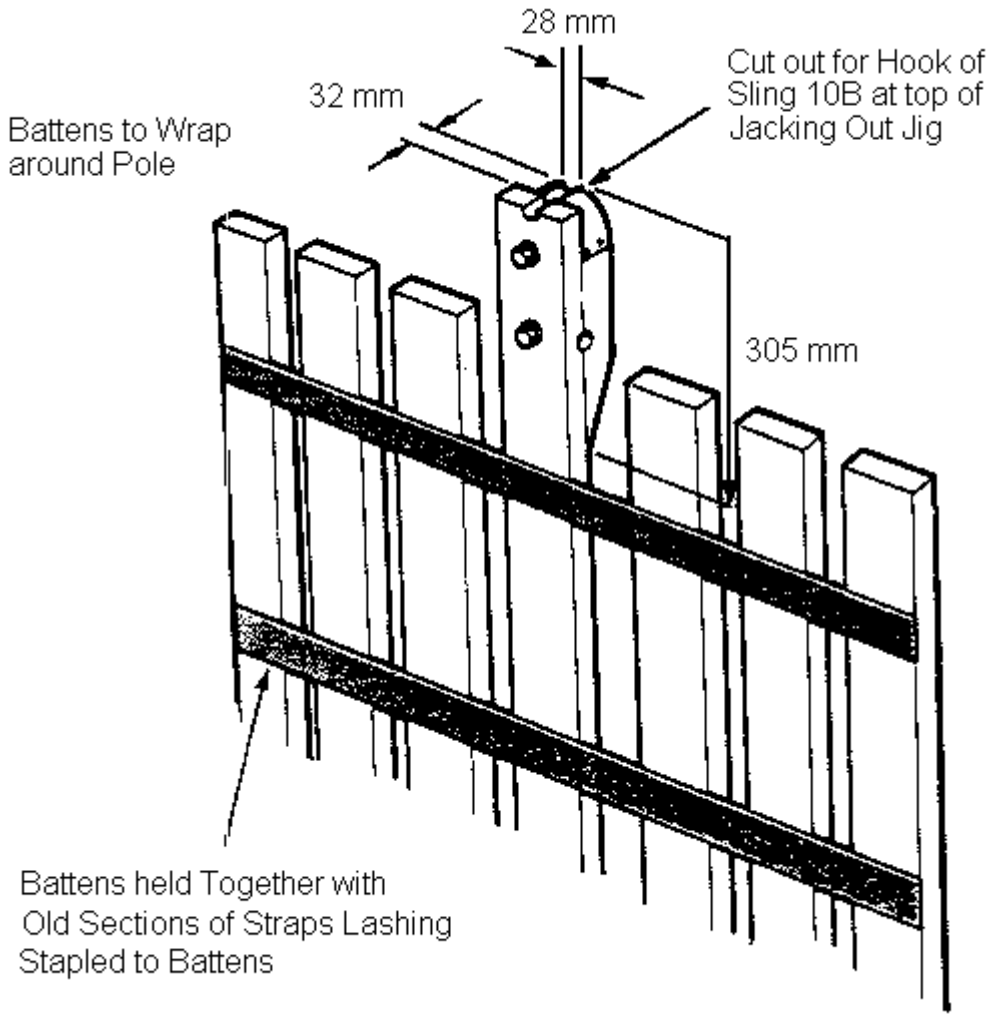


Figure 36 Hollow Pole Jacking Jig for use with Sling 10B

Take great care when attaching the sling control hook attached to the roundsling under the door lintel to keep hands and fingers clear of the sling as it tightens. When jacking out take care that the sling control hook does not become unhooked from the door lintel (tape it in place).

7.4 Pole Removal

The pole should be jacked out of the ground, the jib of the crane being raised sufficiently or the winch wound in to keep the sling vertical and under slight tension to steady the tip of the pole. That is, the crane is used to hold and steady the pole. The jack is used to do the lifting.

Lift the pole with the jack until it has been lifted about 650mm and at the same time raise the boom to keep tension on the sling. If you are using a unit with a pole claw ensure it does not become tangled with the pole steps.

If the jack chain slips, DO NOT attempt to stop it with your hands. Pushing down and inwards on the chain with the end of a spade or shovel or releasing the chain and putting a couple of twists in it often help. If the fails, for wood poles, hammer either staples or a pole step upside down just above the chain; for hollow poles see Section 7.3.1.

On no account should the crane be used either to pull the pole out of the ground or to rock it loose as serious damage and possibly injury can be caused by this practice.

Note: If undue resistance is encountered, and the jack will not remove the pole, it is possible that the pole is blocked. Stop jacking and manually excavate the soil around foot of the pole until the pole can be lifted easily. Continue to support the pole with the crane while excavating the base of the pole until the back will remove the pole. Where the pole is blocked, the blocks may be cut off below ground level.

Hold the pole by the crane, and lower the jack after releasing the chain if necessary. Re-attach the chain, if released, when the jack has been lowered.

Continue to simultaneously lift the pole with the jack and adjust the boom until the butt of the pole is almost free of the ground. Always keep the sling taut and vertical. DO NOT lift the pole with the crane until it is no longer held by the ground.

When the pole is no longer held by the ground, hold the pole steady, release the jack chain, clear away the jack and its base. Attach a control rope to the exposed butt and hold the rope in readiness for final lift.

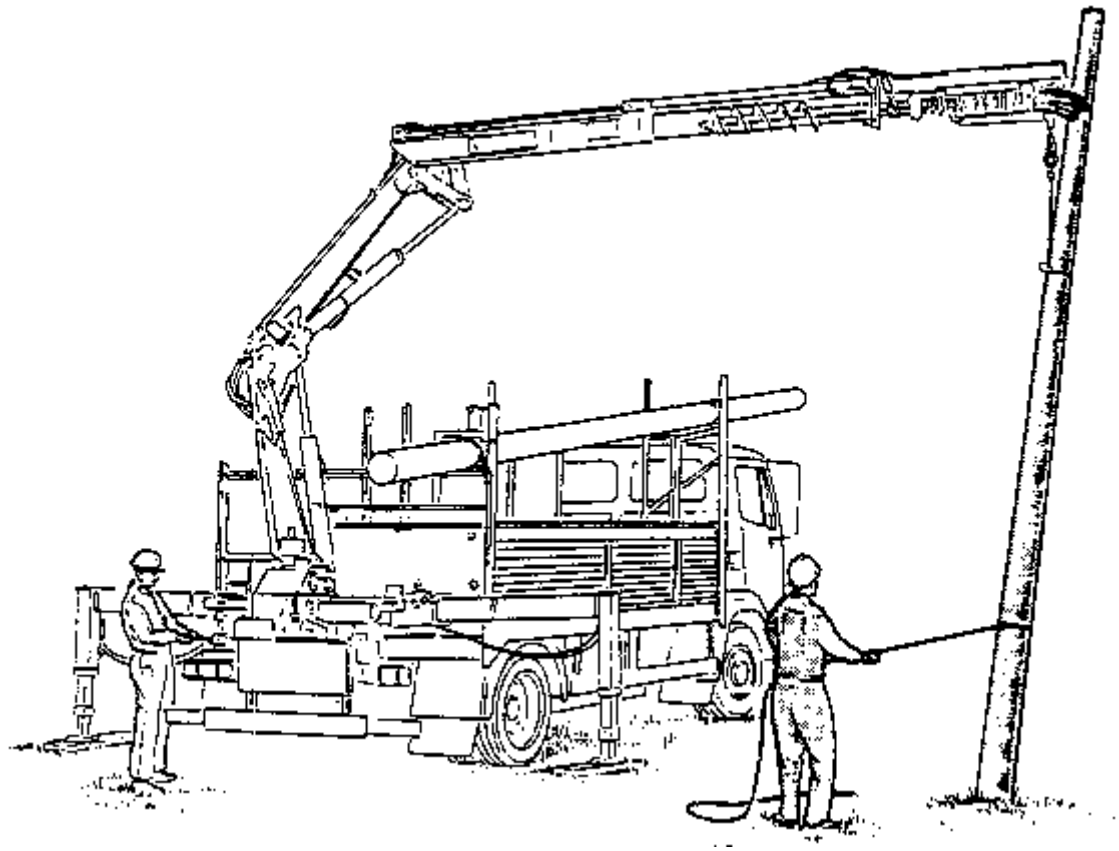


Figure 37 Pole Removal

Raise the boom and extract the pole, control the butt with the rope as necessary. Take care to control the swing of the butt of the pole as it comes free of the ground.

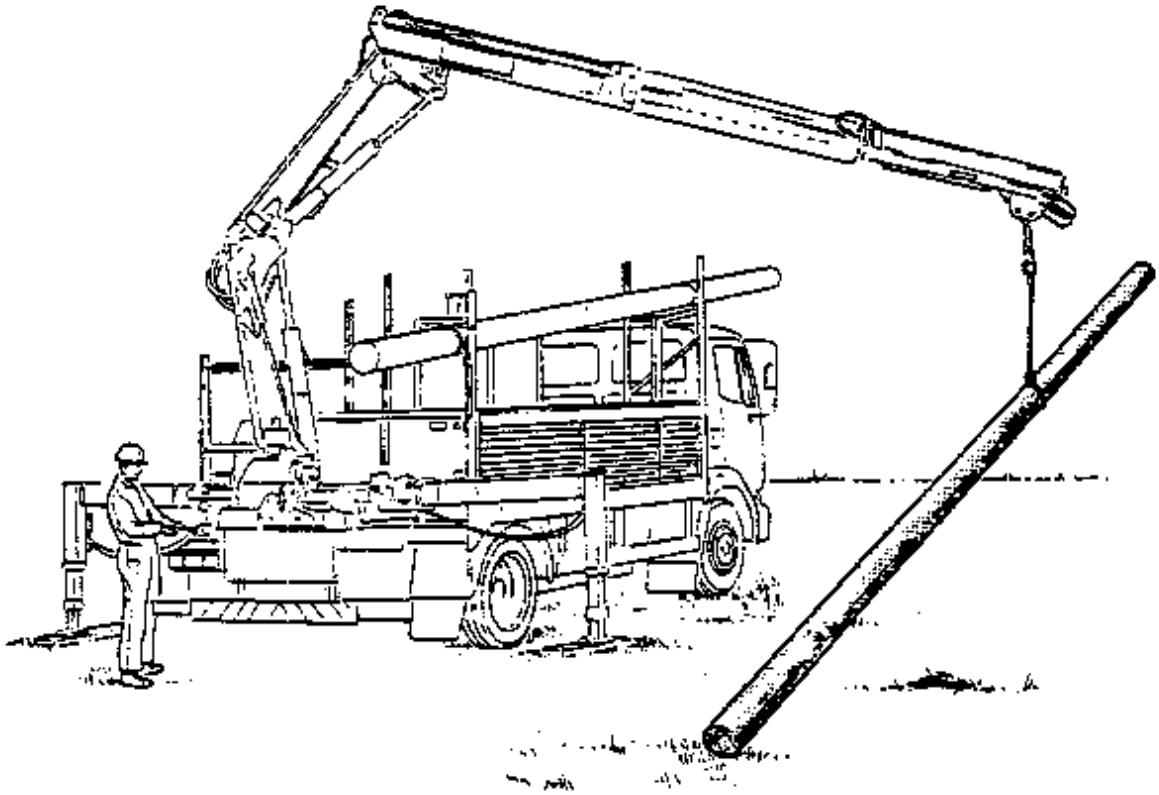


Figure 38 Lowering Pole Prior to Undressing

Lower the pole onto the pole horse keeping the sling vertical.

Undress the pole, using an impact wrench where available, or hand tools. Load the pole tip heavy as normal, only releasing poles stored on the PEU during the loading operation if necessary, and ensuring they do not move during the operation.

Resecure all poles as soon as possible.

8 *Stay Anchorage's*

Prior to any stay anchoring work ALL the requirements of Location of Services and Safe Digging must have been carried out. Do not forget the stay anchor enters the ground at an angle and you must check the whole of the area the stay will penetrate.

Screw in stay anchors (see Figure 39) can be installed by most BT vehicles equipped with augers. This is achieved by means of a tubular stay adapter (adapter anchor stay) fitted on the hexagonal drive shaft in place of the auger. These units must not be used to install stays on joint user poles.

Remove the auger from the unit as described in Section 2.6.3.

You should not stand closer than 3m to the auger whilst it is being driven in.

8.1 Installation

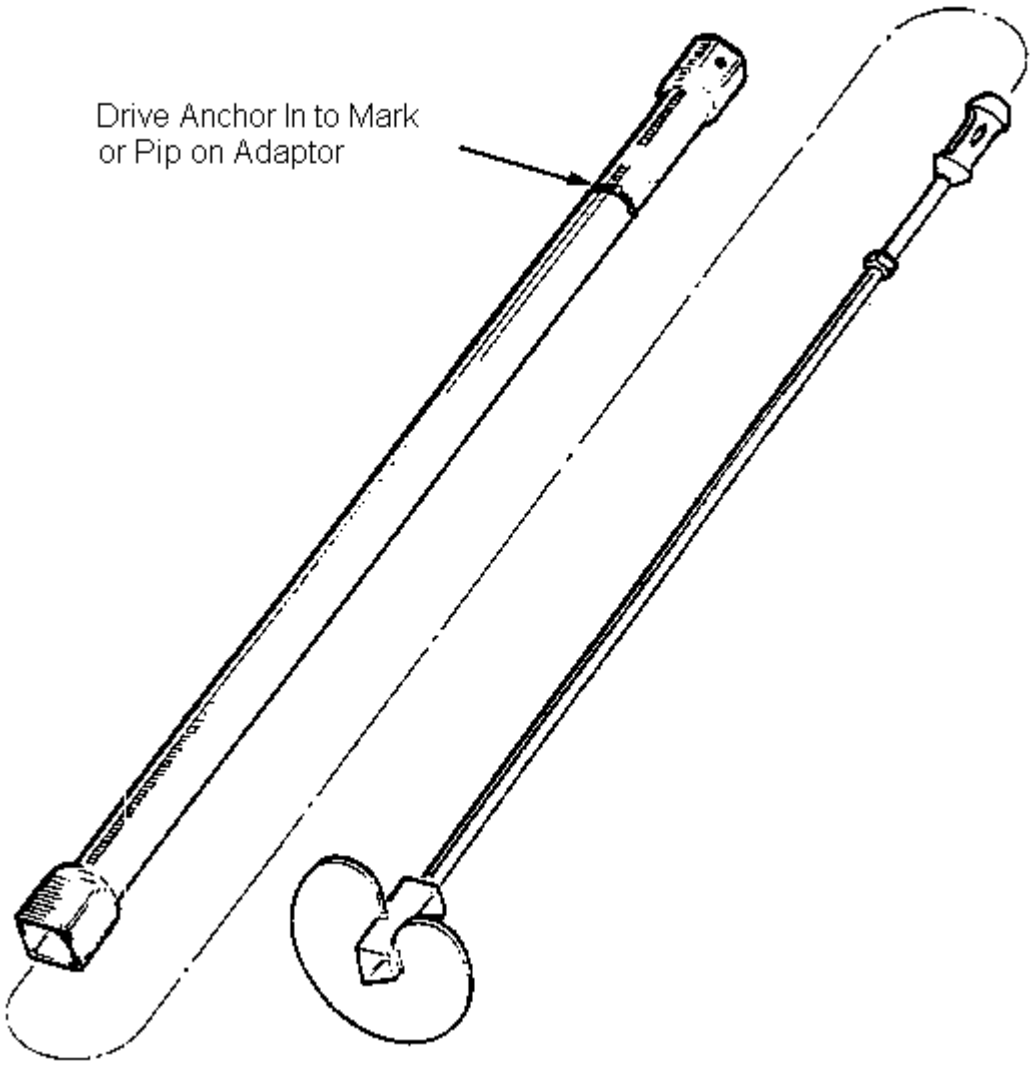


Figure 39 Stay Anchor

Standing on the ground, hold the Adapter Anchor Stay vertical with the square end resting on the ground, and Steps 2 Tread beside the adapter. Raise the boom of the crane and place the hexagonal end of the auger drive shaft into the hexagonal socket in the end of the adapter. Once the drive shaft is securely in the adapter, replace the auger securing pin/bolt to secure the adapter to the shaft using the steps for access if necessary.

Check that the fitting on top of the stay is free to rotate, that the flight is free to rotate and that it is wound down to the tip of the anchor.

Bend the shaft of the stay anchor slightly to make it stick in the adapter, and raise the adapter to install the stay anchor into the stay adapter. Lower the adapter and engage its square end over the square boss on the rear of the

stay anchor plate. Never put your fingers under the flights of the auger during this operation. If the anchor has to be rotated, use the upper edge of the anchor spiral. Once the anchor is in the adapter, keep the assembly as near to the ground as possible and keep your feet from under the anchor in case it drops out of the adapter.

Position the stay anchor vertically in the required position and screw into the ground for a few inches before moving the boom to drive the anchor fully in at the correct angle.

Screw anchors should be installed at an angle so that they will be in line with the stay fitted. There are two methods of installing them, one method fairly easy but with little scope due to the necessary position for the vehicle causing access problems, the other method requiring greater operating skills but with greater freedom from access problems.

- Method 1 Keep the stay anchor in line with the boom and slope it toward or away from the vehicle. The anchor is then screwed into the ground by adjusting the boom to maintain the correct stay angle. The second person will be needed to sight and give directions.
- Method 2 Slope the anchor out at an angle to the boom/jib and feed it into the ground by lowering and rotating the boom. Movement of the boom/jib will also be required to keep the stay anchor pointing toward the pole as the boom rotates. It is most important that the force extended by the boom in rotation should be kept very small and the action of feeding the stay anchor must be considered as a series of very small downward thrusts between each of which occurs a slight sideways movement to maintain the angle.

The speed of rotation of the stay anchor should be kept low to avoid the stay anchor entering the ground faster than the stay adapter and pulling itself out of the square end.

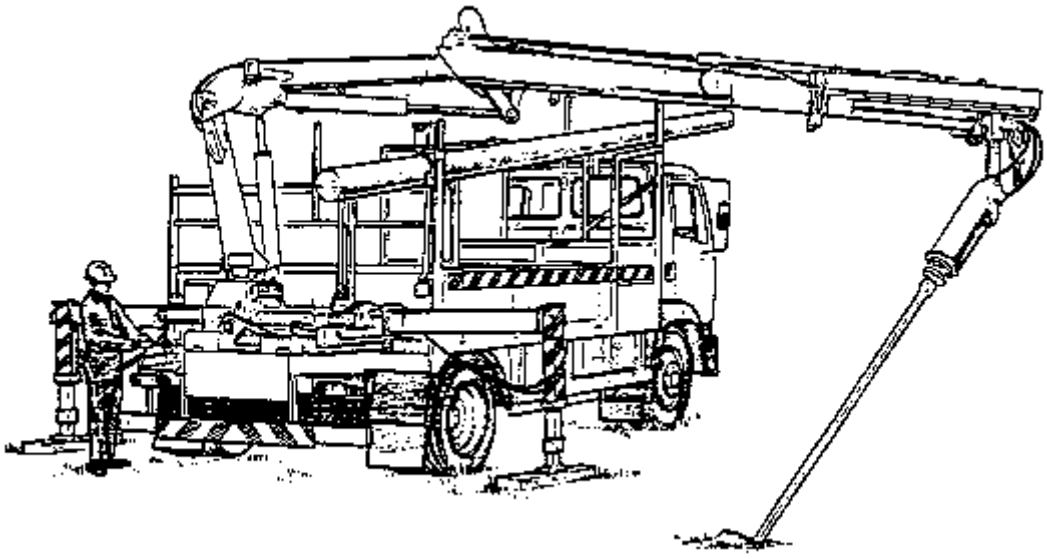


Figure 40 Installation of Stay Anchors

Also, undue pressure must not be exerted on the stay anchor, the stay **adapter** being fed in just fast enough to keep up with it and the stay **anchor** pulling itself in. Do not allow the anchor to pull the boom down.

When watching the angle of the stay anchor, it is easy to let the angle change without noticing it as the change may occur very gradually. It may be helpful to drive a suitable rod into the ground at the required angle on the far side of the stay anchor from the observer and use this as a guide to maintain the angle.

The correct depth for the stay anchor is indicated by a ring of welding around the stay adapter (or a 'PIP' of weld) and this should be at ground level when the required depth has been achieved. (The end of the anchor should protrude by some 3-400mm from the ground. Shallow anchors must be reset.)

The adapter should then be gently withdrawn upwards off the stay anchor. It may well be that some binding will be experienced at the squared end of the anchor rod in the adapter. In this case, slight rotation of the auger drive, without pressure on boom, will normally cause the adapter to pull itself from the squared end.

The boom should then be raised and the adapter removed and the auger replaced, by reversing the installation process.

9 *Method for dealing with leaning poles*

Introduction

There are several reasons why a pole begins to lean after installation, including, ground conditions, pole depth, pull on pole and quality of reinstatement. A leaning pole is reported as a defect via the A1024 system (ARTISAN). Currently, the A1024s are recorded with a defect code of 502 (pole fittings) and given a remedy code of 321 (re-set pole). The method of reporting a leaning pole is documented in the leaning poles process from the link on the pole test home page

Process

All overhead plant (loading) should be removed from the pole to ensure safe working practices are followed. The pole should be lifted/jacked out of the ground using the documented process detailed in section 6.4. The revised planting depths detailed in EPT/OHP/B058 section 3.2 must be achieved to ensure pole stability in poor soil/ground conditions (one of the main causes of the problem). The pole is then re-planted using appropriate backfill material for the ground conditions detailed in EPT/UGP/B053

On completion of the work, the pole should be of sufficient height to meet the new dropwire & aerial cable install/replace heights as detailed in EPT/ANS/A013 If, prior to work commencing, the use of the existing pole, planted at the depth detailed in EPT/OHP/B058, would be deemed to compromise the new dropwire & aerial cable install/replace heights as detailed in EPT/ANS/A013 then a DFE from the programme office may be sought to replace the pole with a new larger pole.

Wood Poles Fit for Re-issue

Poles that have been recovered may be considered fit for re-use if they meet the criterion detailed in ISIS EPT/OHP/B058.

10 *Stowage*

- Stow boom for transit, taking care not to over retract boom where it is necessary to leave a slight extension for stowage.
- Stow the stabilisers as described earlier.
- Release throttle control; disengage PTO.
- Finally ensure you have checked all equipment is stowed and locked and that the load is secure and marked if necessary.

11 *References*

- Operator's Handbook For the Particular Vehicle
- Street works & Road works a code of practise
- EPT/OHP/B033 - Poling Handbook
- EPT/OHP/B058 - Poles, Planning Information
- EPT/OHP/C022 - Pole Examination and Testing
- EPT/PPS/B046 - Work on Overhead BT Lines in the Vicinity of Power Lines
- EPT/PPS/B026 – Code of Practice - Protection of Telecommunication Lines from Power Lines
- MTT/VHE/E001 - the commercial vehicle drivers handbook.
- SFY/GRA/A005 - the existing generic risk assessment for erection of poles
- SFY/HSH/C006 – Manual handling guidance, all persons must be trained and follow the guidance on manual handling risk assessments, the ISIS provides good guidance to ensure compliance with the Manual Handling Operations regulations.
- SFY/HSH/D009 – Ropes, rope slings and webbing slings, relevant to inspection of the slings prior to use.

- SFY/HSH/D011 – Personal Protective Equipment, standard guidance and rules for types of protection that must be worn and when.
- SFY/HSH/D048 – Transportation of recovered scrap cable, this document explains PEU weight and maximum payloads.
- SFY/HSH/D057- Safe Digging and Location of Buried Services
- SFY/HSH/D081 – Lifting operations and lifting equipment, existing guidance for lifting operations.
- Any other appropriate sections of the Health & Safety Handbook

12 *Appendices*

for a word copy of the checklist

12.1 Appendix 1 - Transport of dressed poles on PEU

Section A	Transportation of dressed poles on a PEU must only be carried out as an operational expedient, where site access is restricted, and time for parking the PEU is limited, and/or setting up pole on horse for dressing on site is not possible. The pole should be dressed at a point near to the worksite, and brought in on the vehicle and planted promptly. Are you satisfied that such operational restrictions apply in this case?	**Yes/No**
Section B		
The Individuals	Are the team engaged on this task:- 1. Aware of the restrictions for transporting dressed poles 2. Dressing the pole at a point as close as reasonably possible to site. 3. Transporting only a single dressed pole in each bay on the PEU (max 2) – and no other poles are on the PEU?	**Yes/No** **Yes/No** **Yes/No**
The Task	DRESSING / TRANSPORTING THE POLE	

	A single pole is being dressed as close as reasonably practical to the worksite.	**Yes/No**
	Is the only pole being transported in the bay (max 2 on PEU)	**Yes/No**
	The pole is strapped appropriately for transport,	**Yes/No**
	Normal lifting operations are deployed to load /unload & plant the pole.	**Yes/No**
	That one of the team is acting as Team Leader, and giving the necessary instructions and guidance to the crane operator	**Yes/No**
	If the old pole is also being removed from site in a dressed condition, that it is unloaded and stripped of ironwork as soon as practical, and NOT transported all the way back to the depot with its ironwork in place	**Yes/No**
	<u>TEAM LEADER</u> An individual has been nominated as the one to co-ordinate the operation	
<u>The Environment</u>	Even though site access or time on site is restricted, there is still sufficient room to deploy the PEU correctly and carry out the lifting /planting /recovery activities	**Yes/No**
	There is no risk of slippage by the operatives (No ice or slippery surface)	**Yes/No**
	The incline (if any) and/or ground conditions has been taken in to account as part of the risk assessment.	**Yes/No**
	The weather will not interfere with the operation (strong winds, heavy rain etc.)	**Yes/No**
	All aspects of New roads & Streetworks (NRSWA) and Traffic Management Act (TMA) are complied with, and local /Highway authority notified as required	**Yes/No**
Section C	Describe, here, briefly how the operation will happen.	
	Information communicated to the poling team and copy of this assessment retained by Line Manager for minimum 1 month. Signed: ……..	

	Date: ……..

12.2 Appendix 2 - Transporting Cable Drums on PEU's

The process for having a PEU modified, providing a 'securing bracket' placed in the aisle, to which a cable drum can be secured.

Click here for a word copy of the appendix

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