Engineering Safety Guide 1

General precautions

BT

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A reference system has been used in this Engineering Safety Guide (ESG). When a number in square brackets, eg **[2]**, is indicated in the text, refer to the instruction table at the back of the book.

Contents

'Don't let this happen to you'–

This bloody mess may shock but it demonstrates the consequences of foot injury more effectively than any words

The Health and Safety at Work etc Act [1] covers all spheres of work. It sets basic safety responsiblities for employer and employee alike. Keep your responsibilities firmly in mind.

In general terms you must:

- take reasonable care to avoid injuring yourself and others;
- co-operate with management and others in meeting safety standards.

Note that Health and Safety Executive Inspectors may use the technical requirements of the Factories Laws to judge safety in non-factory engineering work situations.

Safety starts here

Safety rules are often written in blood – our own and that of our

friends and fellow workers. Regretfully most safety rules mirror the lessons of pain and suffering learned the hard way by our more unfortunate colleagues. Experience indicates that most mishaps occur when straying from standard working procedures, safety rules and common sense safety practices.

Such working procedures are detailed in ISIS documents and are the overriding authority.

Follow these rules and you will avoid the risk of injury.

ESGs merely gather together safety information and present it in an informal manner. They also act as a convenient reminder of the source of more detailed information.

Please remember, safety guides and safety rules are of little use if they are only seen but not read . . . read but not applied . . . known but not observed . . . deliberately flouted . . . sneered at . . . or ignored.

Take some time to read and digest this ESG. Keep it handy when you work and be safety-minded! Try looking at it this way, safety- mindedness can be infectious and, like politeness, costs nothing. The rewards though far outweigh the effort.

Look around at your colleagues, do you really want to hurt, cripple or maim them?

Always pause, however briefly, and think out the next move before you make it. There is always a safe way to do any job. The safe way is usually equally quick and easy in the long run.

Safe practices are productive practices. It is not worth saving five minutes on a task if it leads to 30 days sick leave. Tools and equipment are replaceable; your hands, eyes, or even life are not.

Always one chief

Proper supervision and control of a working party is of paramount importance. One person and only one person, must be in charge.

This also applies to circumstances where a number of people are temporarily brought together for work involving concerted action. Here the most senior trained person regularly employed on the type of work will normally be nominated to take charge.

Here are some important safety reminders for anyone in charge of a working party.

You must:

- Make positive arrangements for the leading hand to take charge immediately you leave work for any time, no matter how short. Where there is no leading hand the senior person who is suitably qualified should take charge.

- Give special attention to guiding trainees and inexperienced people.
- Ensure that officers giving temporary help to your party are only given those tasks which are within their individual capabilities and experience.
- Clearly explain individual roles to a party before undertaking joint action.
- Give all directions for concerted action yourself.

This concerns you

Correct working procedures

These have been worked out carefully with safe working practices in mind. Stick to the procedures set out in the instructions and always carry out safety tests, observing any specified precautions. Each deviation adds to the risk of an accident.

Behaviour

Obviously accidents are not always confined to actual working operations. So, take reasonable care at all times – no horseplay or practical jokes.

Call for help

Sometimes a person or a working party unexpectedly needs advice or help in meeting safety requirements. Do not carry on in the face of unsafe conditions; ask for the necessary advice or help.

Spare a thought for inexperience

Trainees, specially the young ones, are particularly prone to imitating irregular practices and are unlikely to realise the risks involved. Remember also that people experienced in one sphere may lack experience in another. Always set a good example to such people. Whenever you can, encourage and guide them in correct working practice and in taking proper precautions.

Keep the work area organised

Tidiness of work and storage areas is good insurance against fires and accidents. It is a matter of common sense to:

- stack stores securely;
- keep gangways clear;
- ensure the immediate work area is free of obstructions or clutter;
- not drop debris underfoot;
- tidy as you go;
- not leave tools lying around loose – use a tool-bag, tool-wallet, tool-bass or belts-pocket as appropriate.

Keep a tidy vehicle

A tidy vehicle and plant layout promotes safe and efficient working. Organise the contents of your vehicle to eliminate awkward manoeuvres, awkward lifting postures and hidden risks of injury to hands.

Here are eleven pointers to help achieve a tidy vehicle:

- establish if the appropriate instructions specify the storage facilities and a standard layout for the vehicle;
- keep heavier items at low level and as accessible as possible for safe handling;
- have a set place for everything;
- do not cart around junk or unnecessary items;
- keep scrap in suitable containers and empty them frequently;
- use the various special containers available where appropriate, for example for Gloves IR;
- keep small stores in labelled cartons;
- keep tools in tool-wallets and bags etc;
- carefully segregate and protect safety belts;
- keep personal protection equipment handy;
- and, should pressure of work lead to untidiness, take a break and clean up before things become hazardous.

Looking after number one

Preventing injury

Almost half the present injuries to engineering technical grades could have been avoided or reduced in severity by wearing the appropriate personal protection equipment. It is therefore essential that maximum use be made of such equipment.

Dirt and contaminants

Failure to wear the proper protective clothing, to wash appropriately and to attend cuts, wounds and splinters immediately, can lead to poisoning and disease. Good hygiene is a must. Be sure to wash your hands (and if necessary your face) with soap and warm water before meals or after leaving work, *especially* after handling cables or items likely to have been fouled by dogs, rats and other animals. Pay special attention to finger nails – nail brushes are available on local purchase.

Rings

Rings on fingers and metal watch straps can all too easily catch on projecting metalwork or bridge an electric circuit. Remove these and other metal jewellery before starting work. If a ring cannot be removed, cover it effectively.

Your head

Keep away from the dropping zone of work or loads aloft. Wear an official safety helmet wherever there is any risk of head injury – a hat bump will only guard against minor risks such as bumps and grazes.

Your comforts

Comfort or winter-liners are also available for use under helmets to minimise the effect of cold.

Your hair

Suitable caps are available for those with long hair. So if your hair is long, cover and tuck it in.

Your eyes

Eyeshield No.5 protect from minor, direct impacts from the front. For full protection, Eyeshield No.3A are necessary. They are available for fitting over ordinary spectacles. Industrial spectacles with prescription corrected lenses are provided to people with monocular vision.

Your breathing

Regard all dusty conditions as harmful. Respirator 3A will cope with most general needs.

Your body

Always wear protective clothing of a good fit, appropriate to your duties, make sure they are reasonably clean and properly fastened. If you wear a neck-tie tuck it in. Do not wear badly contaminated garments, those soaked with oil, for instance, or put oily rags in pockets.

Note: Polyester cotton cloth melts as it burns. Do not beat at it, smother it.

Your feet

Always wear the appropriate footwear at work. You are entitled to free footwear if your feet are at risk whilst you work.

Your health

Never cut food with a pocket knife which has been used to trim or cut cable or wire.

Your hearing

Engineering work can include areas of risk to hearing. Wear official ear protectors (Protector Ear 1A) where prescribed.

Your hands

Watch for sharp edges, projections and parts of equipment likely to trap your fingers. Make full use of gloves, barrier creams and hand cleaners available to you.

You may use your official personal protection equipment for working at home.

Walking

Wear the boots or shoes suitable for your work and walk cautiously on uneven or slippery surfaces – for example, ploughed fields, overgrown or derelict land. Avoid such places if there is a safer way round.

If you need to consult a document or check on a point overhead, stop to do this – never walk backwards. When working on or near a road at night, High Visibility Garments (obtainable from stores) must be worn.

Climbing

Climbing over obstacles such as walls is usually risky; walk around where possible. With spiked railings, do not even think of climbing over. Enter a railed enclosure by the gate, obtaining the key if locked. If this is not possible, obtain access by means of an appropriate aid such as an elevating platform.

Climb unencumbered. You should wear protective footwear whilst at work. If your duties

involve a risk of foot injury, you will be provided with suitable protective free issue footwear which must be worn. Rubber boots should only be used for climbing poles or ladders where ground conditions make their use essential and they should not be worn when driving a BT vehicle, except when working in flooded areas.

Mud

Scrape any soil off your boots on leaving the muddy area and also before climbing or descending a ladder.

Plant and equipment

Care and forethought in the siting of plant, permanently or temporarily, will avoid the creation of accident risk – particularly those involving access problems.

Basic pointers are:

- site equipment so that it is convenient to reach, operate and maintain;

- keep in mind any environmental hazards, such as bad lighting, low head clearances, tripping hazards;
- do not position equipment where it obstructs passage;
- avoid creating situations which impede subsequent positioning or handling of access equipment such as ladders;
- do not pick a position where the access equipment itself is at risk;
- avoid the need for high level access equipment and in particular, long ladders;
- do not create a situation which requires working in a cramped position
- try to avoid handling heavy or awkward items in cramped situations.

Working position

Remember to adopt a comfortable working position. If, however, a cramped position is unavoidable, relieve the consequent strain by short breaks or frequent changes of position.

Sometimes an awkward body manoeuvre is necessary. Keep such a movement slow and deliberate. When getting up from low level do not rise and turn in one sudden movement. Straighten up first and then turn, in two separate steady, actions. Allow muscles to relax before lifting loads, or making any sudden movements.

Near machinery

Machinery in operation can be dangerous, so maintain a safe distance. Bear in mind that under fluorescent light the moving parts of machinery can appear stationary due to the stroboscopic effect. Should it be necessary to work near working machinery try to get it *switched off*, even if this means re-scheduling your own work to suit. Otherwise be sure to:

- use the guards and other safety devices provided;
- make sure long hair and loose clothing such as ties, bracelets etc, are safe;
- stand so that clothing is well clear of moving parts of machinery.

If your work involves the machinery itself, there are additional precautions:

- do not carry out work on moving parts;
- do not touch or enter upon any dangerous part of machinery without positively and irreversibly disconnecting power by switching off an interlock and pocketing the key. Be sure to display a suitable warning at the isolation point.

If you must remove a guard for access to, or observation of, moving parts, make sure beforehand that the emergency stop is within reach or is operated by an assistant if necessary. Replace the guard immediately the task is finished. Removal of guards may only be undertaken by authorised and trained staff.

Mechanical aids

Properly used, mechanical aids make work easier and safer, especially when carrying out certain high-risk manual operations. But some aids carry their own risks and *only trained people may operate power driven mechanical aids*. Do not forget the general rules for work on or near machinery.

So, if you are not involved in the work, keep away from the area or from a self-mobile mechanical aid, such as a fork-lift truck, on the move.

Electric drills

These are the most common of aids with a particular hazard. When drilling hard materials, there is a risk of the bit 'binding' and the drill 'snatching'. The ways to combat this are elementary:

- use only sharp bits;
- hold the drill firmly with both hands;
- do not use excessive forward pressure;
- if the bit does bind, release the switch right away and ease forward-pressure while still holding the drill firmly;
- do not use switch lock-on button.

And welding

Only trained and qualified personnel are allowed to use welding equipment.

If an acetylene welding plant has to be moved, first ensure that the by-pass flame is extinguished and that the cylinder valves are turned off.

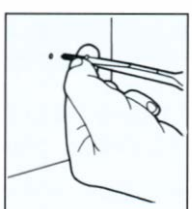
Look after your tools and be sure to keep them in first class condition. Scrap or exchange any that are damaged or worn beyond repair and always use the proper tool for the job. Mis-use of hand tools is the most common cause of accidents.

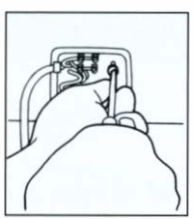
Knives

- Do not use a knife if there is a proper and safer tool for the job.
- If a knife must be used, make sure it is the right type and sharp. This avoids the risks of employing too much force.
- Keep hands behind the cutting edge when applying pressure and cut away from the body.

Screwdrivers

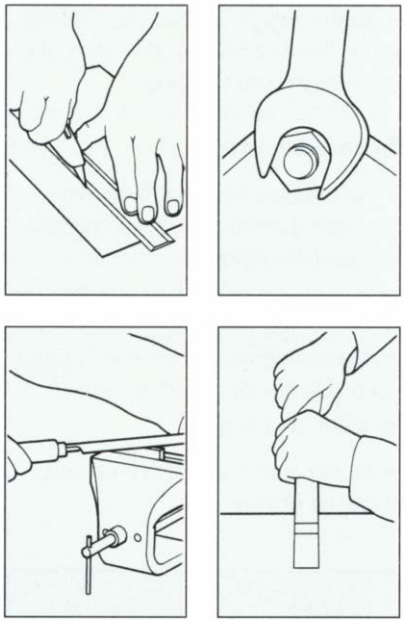
- Be sure to use the right type and size for the job. Keep blades in good condition.
- Do not use the hand as a vice.
- If possible place the work object on a flat surface and secure against slipping.
- Never use a screwdriver as a lever or chisel.





General advice

- Use the right size of spanner to fit, nut or bolt.
- See that every file has a handle.
- Do not use chisels, punches, and the like which have mushrooming heads.
- Keep hammer heads tightly wedged in place.
- Renew wooden handles that show signs of splitting.
- Keep cutting tools sharp, and the hands behind-the cutting edge when working.
- Keep tools in bags, wallets, or an equivalent, when not in use.
- Protect sharp edges of tools which will be stored or carried.



System leaks

A jet of gas or air escaping from a high pressure system can cause injury [2]. If a leak occurs in such a system, clothing provides little protection, so keep well clear and report the incident to the appropriate line manager for qualified attention. Remember that similar procedures apply to hydraulic systems [3].

Compressed air

The wide use of compressed air also poses problems, simply because the risks of mis-use are not always appreciated. There are four rules which must be followed.

- Do not use it so that filings, chips and shavings are thrown up to endanger personnel nearby.
- Do not dust yourself down with compressed air - because if it is strong enough to dust and clean, it is strong enough to injure eyes, ears and nose and to enter the skin via a scratch or puncture.
- Do not put a hand into the airstream – because air may enter the skin and force its way into the bloodstream.
- Do not indulge in horseplay or direct a jet at someone else – because of the reasons already mentioned.

Handling cylinders

- Always keep acetylene cylinders upright.
- Use a proper trolley to handle air cylinders. [4].
- Never lift or move a cylinder by means of the regulator.
- Never drop a cylinder or subject it to shock.
- Never leave a cylinder projecting beyond the limits of a loaded vehicle.

Look after cylinders

Clearly there are a number of risks resulting from careless treatment of gas or air cylinders especially during handling. Valves or fittings on cylinders must be clean and grit-free, and never lubricated or greased, even from contact with greasy hands, gloves or rags. Oil and grease will burn violently in the presence of oxygen.

Cylinders have to be kept away from direct heat, including sunlight, and from sparks and corrosives. They should not be stored in contact with damp ground or floor, but placed in the storage facilities provided.

Care with aerosols

There are very few engineering operations where use of aerosol sprays is approved. The relevant instructions will deal with safe usage in any necessary circumstances.

However, casual use of domestic-type aerosol packs is widespread and the basic precautions must be kept in mind.

Observe the manufacturers' precautions to the letter. Be prepared for the effects of wind or draughts on spray. Do not expose to heat even when empty. Before disposal empty any residue under controlled conditions. Do not puncture or incinerate.

General

Where appropriate the other ESGs will contain information on particular hazards with substances. General considerations are as follows.

Marking and labelling

By law, packs containing materials with a significant hazard are labelled to indicate substance, nature of risk and precautions [5]. A system of hazard symbols makes such packs easily recognisable.

Mild irritants

Even substances which are not classified as hazardous may cause mild skin irritation. Washing with soap and warm water usually relieves the condition.

Lead-based paints

Work with lead-based paints can involve a lead poisoning hazard. People regularly involved with painting work must therefore know and follow the requirements of [6]. But, for occasional painting – usually the only sort underaken by BT people – it is sufficient not to spray lead paint, not to dry rub-down lead painted surfaces and to keep a good standard of personal hygiene.

Aluminium paints

With certain types of aluminium paint a little moisture trapped in the tin can lead to a build up of pressure. New tins carry a warning of the risk of paint spraying out under pressure when the lid is removed.

Highly flammable | **Harmful** | **Corrosive** | **Irritant** | **Toxic** | **Oxidising** | **Explosive**

However, a partly used tin – even more likely to have trapped moisture inside – may have the warning label smudged and unreadable. So, be cautious by opening all tins of aluminium paint while holding a wad of protective rags close over the lid.

Asbestos

Full information on the asbestos hazard is given in **[7]** and in related instructions. ESGs 2 and 3 and **[8]** contain reminders for particular working operations.

By the very nature of the business, every one will have some dealing with electrical power. Treat power supplies with respect.

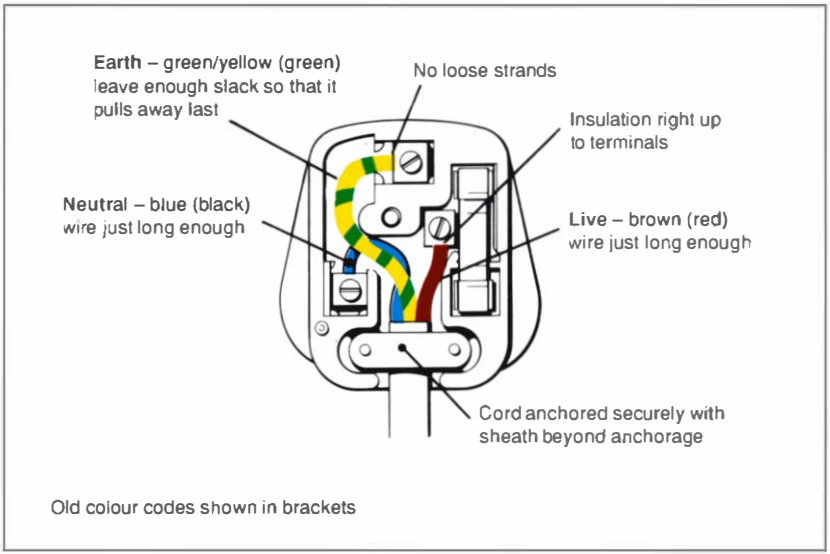
Never interfere with power supply circuits unless you are competent and authorised to do work on them. Above all ***never work on a live main voltage circuit*** (except in certain, very exceptional circumstances and then only if competent and authorised to do so).

Always fit a fuse of the lowest rating compatible with the appliance concerned. When a fuse blows, look for the cause – if you are competent to do this – before replacing it. If it blows again, obtain expert help.

Do not resort to such outrageous practices as wedging wires in power sockets with matchsticks. An official issue or officially approved plug, correctly terminated is essential.

Note the finer points in terminating a 13 amp plug as shown.

Before you use a portable appliance examine the mains lead, plug, and so on for signs of defects. Have it repaired, if necessary.



Some miscellaneous reminders

Seeing the doctor

If your doctor is prescribing medication for you, tell him/her if your work involves a material degree of risk. This includes driving, working at heights and proximity to moving machinery.

Lasers

Untrained people may in no circumstances use a laser. Even work in the vicinity of a laser is subject to restrictions as set out in [8].

Pay attention to safety notices

Obey those notices prohibiting unauthorised entry to particular areas or rooms.

Concentrate

Do not let your attention stray or distract someone else. Even simple tasks often require concentration: take an eye off the nail momentarily and your hammer may remind you – painfully.

Nails

Nails, perhaps rusty ones, sticking up from discarded battens or scraps of wood, are a risk to the feet of the unwary – particularly when hidden on overgrown ground. Be wary, and always remove nails and stack battens tidily as you go.

Do not hold nails or screws in your mouth.

Take care with doors

Never rest a hand on a door post. Grasp the handle and not the door edge.

General

Are you familiar with the contents of [9]? You should be. This is the fire precautions policy for buildings. Here are some brief reminders of the basic precautions.

- Do not accumulate combustible materials unnecessarily.
- Store waste paper in a safe place pending disposal.
- Store PVC and plastic waste separately in a metal bin with lid.
- Where possible, be sure to dispose of rags contaminated with anything flammable immediately and safely. But, if necessary, store such rags in a metal bin with a lid.
- Always obey no smoking signs.
- And be careful where you stub out a cigarette.
- Watch where you leave any shaped glass object; it might concentrate the sun's rays and cause a fire.
- Do not dry clothes over an electric fire, a gas fire or a stove.
- Never prop open fire doors.

On work sites

The type of work undertaken at many sites generally tends to increase the risk of fire. Bear in mind especially, the safeguards with combustibles and waste.

Keep any flame well clear of anything that burns easily. By the same token keep clothing away from sources of fire; and, do not discard matches or cigarette ends in a work area.

With highly flammable liquids:

- take only the bare minimum to the work point;
- keep the container open for no longer than is necessary;
- and take care against spillage.

If spilled, mop up promptly.

Never decant flammable or highly flammable liquids within a vehicle body and do not smoke or use a naked flame when near such a liquid. Display a **No Smoking/No Naked Flames** notice, and keep a suitable fire extinguisher handy.

Where rags become impregnated with oil, paint, flammable liquids or highly flammable liquids, move them to a safe place in the open air promptly after use. If necessary, put them temporarily in a metal container with lid pending disposal.

Re-fuelling of petrol-engined mechanical aids on site

This is an operation that must not be done within a vehicle body or other confined space. Before starting to pour petrol, make sure that the appliance being re-fuelled is switched off, not hot and that there is no naked flame, running engines or compressors close by.

Always use a funnel to avoid spillage; and, with a metal funnel, keep the neck of the can – which must be of a regulation type – in contact with the funnel to prevent the risk of static sparking. Replace the cap on the can immediately after use and return the can to its carrier or stowage position.

Garage areas and re-fuelling

The general rule is that no naked light is permitted within 6m of a petrol store or empty petrol containers. You must never smoke near a petrol pump, petrol

can store, or empty petrol cans.

Drivers must switch off the engine before re-fuelling. Keep the pump nozzle in contact with a vehicle tank inlet and be careful to avoid spillages.

Petrol spillage

Where petrol is spilled on the ground, cover it promptly with sand or soil - not oil absorbent granules. Wipe up any petrol spilled on bodywork, treating the rags as you would those impregnated with any other flammable or highly flammable liquid.

Should you inadvertently spill petrol on your clothing do not light a cigarette and do not go near a naked light, until you have changed that garment. Even if you have only handled petrol, such as a contaminated rag, wait at least 15 minutes before lighting a cigarette.

Liquefied petroleum gas (LPG) - propane gas

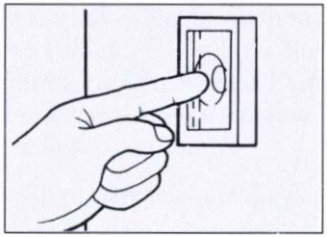
General consideration relating to LPG and LPG appliances are dealt with elsewhere in this guide and relevant precautions will also feature in other safety guides. But, there is one rule for everyone and for every appliance – make sure that all connections are sound; and check with a leak detecting solution.

Coping with fire emergencies

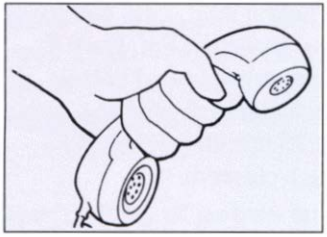
Fire instructions

There are explicit instructions on permanent display prominently positioned in each official building indicating what to do in case of fire. Read and memorise these for the building in which you work. Do likewise with the instructions for using the fire extinguishers.

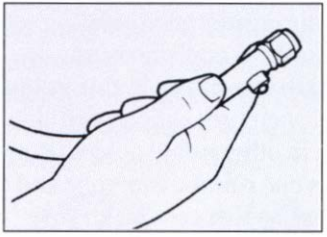
On discovering a fire the drill is:



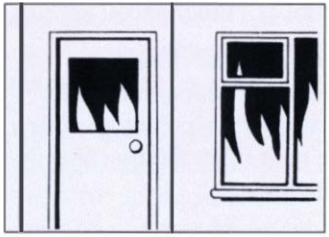
1 Operate the fire alarm; and do not be frightened to shout "FIRE" to summon aid and help warn others.



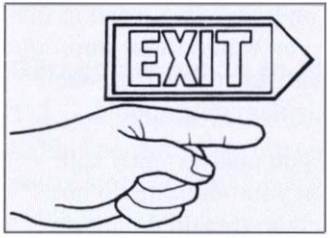
2 Call the fire brigade.



3 Attack the fire with the appropriate fire extinguisher – if it is safe to do so.



4 If the fire cannot be controlled with one extinguisher, retreat to a place of safety, closing windows and doors behind you where possible, provided your escape is not significantly delayed.



5 Evacuate the building when directed by the senior officer or on hearing the fire alarm 'evacuate' signal.

Remember – what you do in the first three minutes after a fire starts is more important than any action you can take thereafter.

You are more important than property, so do not take risks.

Ensure that the fire brigade is given every assistance and guidance on the nature of the fire and any areas which need special attention. For example equipment on which water or foam may not be used until absolutely necessary.

Customers' premises

Many large customers display fire instructions similar to our own. When working in such premises take the trouble to read the fire instructions. – Be prepared!

Work sites

The procedure to follow when , discovering a fire at an external work site is essentially as before.

Larger official vehicles are equipped with a BCF extinguisher located in the cab, and may have an additional extinguisher at the rear of the body compartment.

Small vehicles and cars do not have a fire extinguisher.

Emergencies involving LPG cylinders need special treatment. If a leak is discovered at a cylinder outlet, close the cylinder valve and remove the cylinder to a position in the open – away from any flame, drains or underground structure.

If the leak catches fire close the valve. If possible, use a cloth or thick clothing, to deflect the flame where necessary. But if this is not possible evacuate the area to a distance of 50m and summon the fire brigade.

Be sure to tell the fire brigade when they arrive, that LPG cylinder(s) are involved.

Fires in small vehicles

Fire extinguishers are no longer provided in small vehicles as the driver is often unaccompanied, and help may not be available.

Fires in larger vehicles

Provided the driver is accompanied, a fire may be tackled but no risks should be taken.

A fire within the body or cab, of a vehicle is dealt with in similar fashion to a site fire. If it is an

obvious electrical fire, perhaps below the dashboard, the first priority is to switch off the vehicle engine, disconnect the battery if possible and then use the BCF extinguisher.

An engine fire is trickier:

Keep calm and act quickly – if in a moving vehicle, stop and switch off the engine. Get the passengers well away from the vehicle, and call the fire brigade.

Release the bonnet catch.

To tackle the fire lift the bonnet just enough for the fire extinguisher to be discharged at the seat of the fire – using short bursts. Lifting the bonnet more than is necessary may assist the fire and disperse the BCF.

Never take unnecessary risks if the fire cannot be extinguished, stay at least 50m away from the vehicle. Remind fire fighters fighting a vehicle fire if there are LPG or other gas cylinders on board.

Fire extinguishers – their operation and use

Remember to call the fire brigade for all fires – no matter how small

Water type

Coloured red

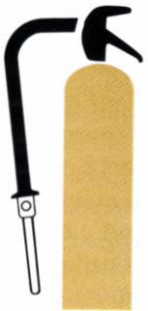
Caution – must not be used on live electrical or flammable liquid fires.

For fires involving solid combustible material such as paper, wood, fabric and rubbish.

Operate the extinguisher, direct jet at base of flames and keep it moving across the fire.

Foam type

Coloured cream



Caution – must not be used on live electrical fires.

For fires involving burning liquids or liquefied solids, such as petroleum, oil, fat and grease.

Where the liquid is in a container, direct the jet at the farthest edge to prevent splashing and to allow the foam to flow across and blanket the fire.

Spray foam type

Coloured lime green

Caution – not to be used on live electrical fires but it is safe in the vicinity of live electrical equipment normally found in offices.

For fires involving solid combustible material such as paper, wood, fabric and burning liquids or liquefied solids, such as petroleum, oil, fat and grease.

Direct the spray at the fire, and sweep the spray across the burning material, liquid or fat.

Halon 1211 BCF type

Coloured dark green

Caution – Do not use in confined spaces. Ventilate area well after use.

For fires involving telecommunications equipment and all electrical apparatus.

Release the safety catch or remove the pin, and squeeze the lever hard.

Direct at the nearest edge of the fire and use a sweeping motion to drive the flames away.

The vehicle-type differs from the other types of BCF extinguishers in a number ways. It is smaller, there is no safety catch and the operating lever is at the rear of the head.

Carbon dioxide type

Coloured black

Caution – Remember that carbon dioxide is heavier than air and can suffocate. Ventilate the area after use.

It is only supplied for use in certain areas, for example laboratories. May be used on fires involving electrical equipment.

At the scene of the fire, remove the safety pin.

Hold the extinguisher by the handle, and the discharge horn on the ribbed section only. *Do not hold* the horn section as it will get very cold during discharge.

Aim the carbon dioxide at the near edge of the fire and sweep across the fire, driving it backwards until completely extinguished.

Powder type
Coloured light blue

Caution – not to be used in confined spaces.

For external use only, for fires involving flammable liquids.

Direct powder at the fire, sweeping across the burning liquid, driving it backwards until completely extinguished.

Other fire fighting aids

Hoses – these are provided on reels where more water than that from a portable fire extinguisher may be required. Use a hose only if you feel competent to do so and remember to see that the supply valve is turned on before starting to pull the hose from its reel.

Fire blankets – these are for smothering small fires involving flammable liquids and fats.

The user's hands should be protected by the blanket and the blanket laid gently over the burning area.

Do not remove the blanket too quickly, allow cooling down time to avoid re-ignition. When removing the blanket, keep the blanket between you and the item that was on fire.

Sand – for small fires and garages or Motor Transport filling stations, buckets or bins of sand are provided. Sprinkle sand gradually – if possible from the direction of wind or draught, to reduce exposure to flames and fumes.

Sand in battery rooms is to mop up spillages of acid, and not for fire fighting. Fires in battery rooms are unlikely, but if they occur, they should be left to the fire brigade, as fires involving acid will require breathing apparatus to be used by the fire fighter.

How and what you lift

Lifting any size of object the wrong way can cause serious back injuries. If your job involves lifting on a regular basis you must be trained in the proper lifting techniques.

Where possible, avoid manual handling by using any lifting equipment available, although make sure that you have been properly trained in its use.

However if you do have to lift, assess the task before you lift and ask yourself the following questions:

- Are you capable of lifting the size, weight and shape of the load?
- Are there any protruding sharp edges, notches, grease or anything that may weaken your grip or injure your hands? You should always wear the appropriate gloves where required.
- How close to the body can you hold the load?
- Will you have to carry the load frequently or over a long distance?
- Is the load at a height you can safely manage?
- Will you have to twist your body?
- Is there enough space for you to carry out the lift, and is the work area underfoot level and free from obstructions?

Never lift a load beyond your capacity. Always seek help if it is too heavy or awkward for you to deal with on your own.

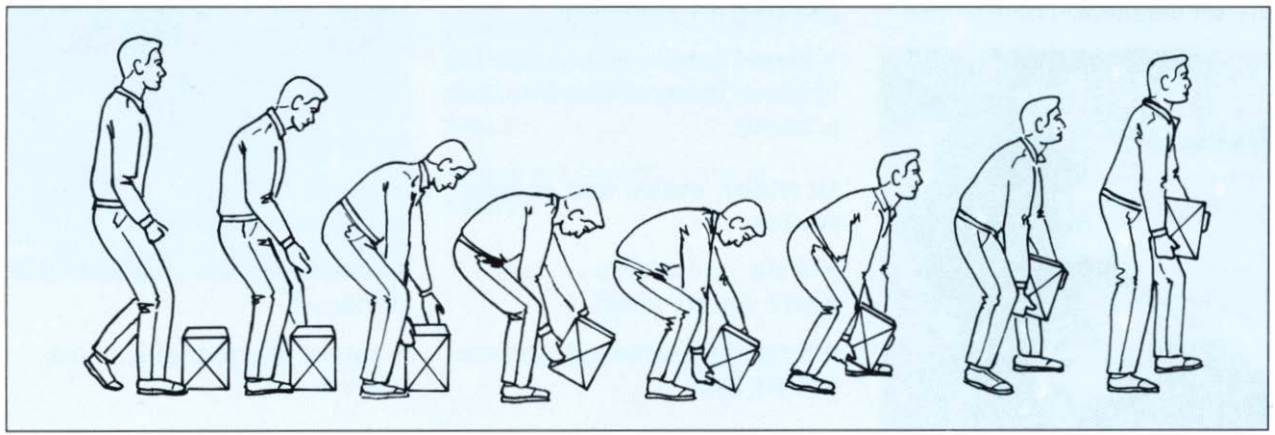
Remember too that you will lessen your chances of injury if your muscles are warm and supple, so carry out some stretching exercises before you lift and make sure that you wear clothes that will not expose your back to the elements when you bend.

A reminder of the fundamental kinetic lift

Place your feet close to the load and settle into a comfortable and well balanced position to provide a firm base for the lift. Lower your body and bend your knees in a smooth action. The angle between your thigh and calf should not be less than 90 degrees because this gives your body a greater mechanical advantage.

You should then tilt the object to the point of balance testing its weight; this also enables you to reach the bottom corner. Ensure that your hands and fingers are in contact with as much of the load as possible.

At the point of lifting always raise your head first, this action straightens your back and allows your legs to take the strain. You should then move upwards in a smooth continuous action. You must never lift and twist your body at the same time.



Minding your p's and q's on official premises

The main requirements are good housekeeping and common sense, with these applying in equal measure to resident personnel, field people and casual visitors.

People who visit to do customer service work on official premises should also remember the rules on page 39. Specific housekeeping points and safety measures to remember for official premises are set out there.

General advice

- Wipe your feet properly on entering.
- Do not drop or leave matches, pins, rubber bands or other debris on the floor.
- Wipe up spilled liquid at once.
- Don't horseplay.
- Observe fire precautions . . . and keep fire exits clear.
- Report defects such as fused lights or damaged stair treads promptly.

Corridor, stairs and access routes

- Walk . . . don't run . . . look where you are going.
- Be alert for messenger trolleys and the like.
- Never leave stores in corridors or on landings.
- Keep pedestal ashtrays where people are not likely to bump into them.
- Do not prop open fire-doors.
- Avoid congregating on landings, stair head or stair foot.
- Use hand rails . . . keep left . . . go single file . . . do not push past.
- Do not go up and down stairs with hands in pockets.

In lifts

- Use lifts sensibly . . . always obey cautionary notices.
- Keep within the maximum load displayed.
- Do not interfere with an out-of-service lift.

- Do not ride in service lifts.
- Never put an arm through a lattice gate.
- Beware closing gates and floor level differences.

In office or assembly room

- Be careful that appliance cords do not trail underfoot.

- That you keep hands, long hair and loose clothing clear of office machinery.
- Make a special effort to keep cupboard tops and windowsills clear.
- Do not leave drawers open, nor open more than one filing cabinet drawer at one time.
- Always consign debris to the proper dustbin. Do not throw broken crockery, cigarette ends and the like into waste paper baskets.
- Stub out cigarette ends in ashtrays.

On roof access ways

A well-used access route across a flat roof differs little from a situation on ground level, *but do not lean over roof guard rails.*

An exposed and infrequently used route, for example for work access, calls for special attention:

- Stick to the designated route.
- Report defects promptly.
- Go no further if obviously unsafe.
- Be alert for slippery conditions.
- Salt or grit, icy areas.
- Report other slippery conditions for cleaning.

Open yards and parking spaces

Open yards and parking spaces

Co-operate with depot people in keeping storage and parking areas secure, tidy, free of rubbish and with enough clear space for people and vehicles.

Park vehicles, trailers and mechanical aids with forethought and within any marked limits. Be sure to leave adequate space for getting in and out of your vehicle safely. Do not obstruct access to a fire point.

It also means clearing up paper, string, wire, fibre bail bands, as you go when unpacking. Do not throw rubbish off vehicles but take it to the appropriate rubbish or scrap bin.

A special word of caution about broken ducts – the pieces can be razor sharp. Dispose of them carefully where they will not be a hazard to others.

Deal with icy yard surfacing using rock salt, and oil spills or grease with oil absorbent granules which should be available on the premises.

Report defective yard surfacing.

Power-operated vehicle lifts

Only MT people are permitted to operate vehicle lifts: but, engineering personnel may help MT people in the use of a lift if expressly asked and properly instructed.

Engineering personnel giving such help must observe four key conditions:

- Perform only such tasks as are expressly requested by the officer in charge of the work on the vehicle in question.
- If asked to drive on to a lift, ensure that the vehicle is located centrally. Apply the handbrake firmly.
- If subsequently asked to release the handbrake, for instance when the lift is raised, first check that the vehicle has been otherwise secured against movement.
- Never try to jump on or off a raised lift. Use the 'Platform Mobile Steps' provided; and, even so, *take extreme care*.

Tyre inflation

Remember the precautions which are required when using compressed air.

Points on transport

In and out

Do not risk falling out. Always descend backwards, hands unencumbered, and use the grab-handle where provided. Think of your fingers. Use the door handle not the door edge to shut the door . . . do not rest a hand on the slam-post of an open door.

Diesel engines

If a diesel engine will not start in freezing conditions do not heat the fuel supply – call a mechanic.

Starting up

It is now seldom necessary to use a starting handle and the correct technique has, therefore, been forgotten by many people. Except with a decompression device (mostly mechanical aids) and when freeing an engine in cold weather (ignition off), do not crank the handle. Stick to the well tried procedure given here:

1 starting handle hanging down;

2 push in until it engages with the crank shaft dog;

3 adopt a comfortable stance as for lifting;

4 grip the handle with fingers only – thumb on the same side as your palm;

5 with ignition on and starting controls set, pull upwards sharply against compression.

Stoves in vehicles

The portable propane stove (Stoves, Propane) is a high pressure appliance. It ***must not*** be used inside a vehicle. The risk of fire or of asphyxiation in some circumstances is too high.

Even use of the permanent low pressure gas cooking stove is subject to four conditions:

- Never light or use a stove when highly flammable liquid is present within the vehicle body. This means petrol, paraffin, oil-soaked rags, and the like.
- Do not hang clothing near the stove nor leave combustible material where it could fall on, or be blown on, to the stove.
- Never have a lighted stove in a moving vehicle.

• Keep gas drainage holes and body ventilators clear.

Before taking to the road

Ensure that your vehicle is roadworthy.

If towing, double check the towing-pin safety clip.

Check that the loaded vehicle is within legal weight limits with load properly distributed and secured.

Restrict passenger carrying to number which can be properly seated in the cab.

See that only specifically authorised items are carried on external roof carriers.

At rest

Apply the handbrake before leaving your vehicle. On a hill engage low gear and turn the front wheels into the kerb.

Do not park so as to cause an obstruction or a traffic hazard, of any sort.

On the road

Wear seat belts where fitted.

Drive with due care and attention at all times.

Check behind before reversing and, use any available assistance to guide you.

Take special care if driving a slow moving vehicle, particularly at unattended, automatic level-crossings.

Service reminders

Report defects promptly, on Form GMT 187.

Be sure to report minor damage, such as to vehicle steps or tail board supports.

On an engine cooling system, open the radiator cap slowly and only half way, with the hand well protected against steam.

Do not attempt to remove either of the filler caps on a sealed engine cooling system.

Safety rules and procedures

Reminders

While **[10]** gives full guidance, in brief, you are expected to observe the customer's safety rules and procedures – where these exist. Indeed, you have a duty to co-operate insofar as the customer is discharging statutory duties.

When receiving work from your control, check if there is a known safety system or abnormal hazard on the customer's premises.

Always report to the customer's security checkpoint or appropriate responsible representative before starting work.

Remember that you only sign BT approved customer 'Permits to Work' or other customer safety documents. In the event of any dispute or question of responsibility, ask your control for guidance.

Be sure to report any new or modified safety rules or systems you encounter.

Your vehicle is not your pass card. Never use its familiarity to short circuit a customer's safety system.

Hazards in general

Where there are no signs of a customer's safety rules or procedures, ask a responsible representative about possible special hazards. If you notice a material hazard bring it to the customer's attention – tactfully, of course.

Some premises present abnormal hazards. That is why anyone on customer work must be familiar with **[8]**. Control points issuing work must remind people of any such abnormal hazard indicated on the record. People in turn should notify, or seek guidance from, control points where unrecorded abnormal hazards are encountered or suspected.

Examples of places with abnormal hazards are radar stations, high voltage sub-stations, oil refineries, petroleum depots, tanker jetties, explosive factories, chemical factories, asbestos factories, building sites, infectious diseases hospitals, medical research units, renal dialysis rooms, nuclear plants, X-ray units, railways, places where lasers are in use and areas protected by $C0_2$, Halon flooding.

Although some premises may not have any apparently significant hazards, normal BT safety rules must nevertheless be observed.

Airfields

Driving on airfields is subject to special instructions. You *must* be in possession of their rules which you must have read and be familiar with.

Follow the briefings and directions given by airfield controls to the letter.

Hazards on building sites

Building sites and similar places are notorious for poor standards of tidiness and for numerous hidden hazards. Some general advice to all is called for. Walk . . . don't run . . . look where you're going.

Be especially watchful for debris underfoot, such as discarded battens with protruding nails, perhaps hidden in grass.

Be sure that you do not add to such hazards in any way.

Make full use of your personal protection equipment.

●n construction sites, always use your safety helmet.

Radiation hazards

While radiation risks on customer's premises are dealt with as abnormal hazards, there are circumstances involving marginal contact. It is therefore important that everyone is able to recognise risk areas.

In premises subject to Factories Act legislation, risk areas can be recognised by the display of the trefoil symbol. The symbol is now more generally used in laboratories, hospitals and on packages or containers. Some lamp signal warning may nevertheless still be used, perhaps where X-ray is in progress.

The lightning arrestors containing radioactive materials and mounted on some large buildings sometimes worry people. There is, in fact, little risk. The lightning arrestors are easily identified and at a very safe distance since they are on a 4.57m (15ft.) mast. Even if the terminal unit (it is 285mm (11 1/4in.) in diameter) is found lying on a roof or on the ground, it is sufficient if you keep a one metre distance although a brief incursion within that distance is not expected to be harmful. Do not attach anything to such a mast.

Ropes, rope slings and webbing slings

If these are used daily, inspect them weekly, otherwise inspect each time before use. *Never* use a suspect item, it could cause injury or damage. In no circumstances should vegetable-fibre ropes be coiled when wet and remember that wire ropes and slings are subject to special certification [11] as are webbing slings [12].

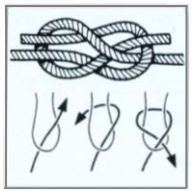
Chains, chain slings and lifting tackle

Examination of these must be carried out by authorised personnel [13]. Do not attempt to repair a defective item yourself Take it out of service immediately pending replacement. A test certificate is necessary for each replacement item. For descriptions of slings see [14].

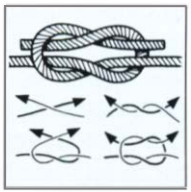
Knots

A knowledge of knots and where to use them is a valuable aid to safety. Information on the simpler knots which are more generally useful is reproduced here.

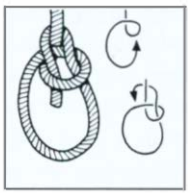
Sheet bend – Used for lengthening rope, and can be used to fasten a rope to an eye splice.



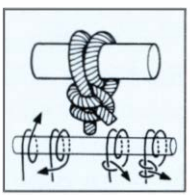
Reef knot – Use as a binder knot to tie-off ends around a bundle or parcel. Do not use this knot to lengthen a rope. There is a risk that with rope ends of unequal diameter, or stiffness, or smoothness, it is likely to come apart.



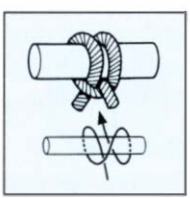
Bowline – Fastens the end of the rope to its own standing part to form a loop knot, for



example for use as a sling. Tighten by pulling the rope end and standing part at the same time.

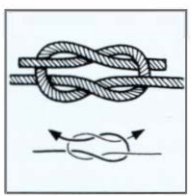


Round turn and two half hitches – Used to secure a rope to a spare rail, post, ring or the like. Two round turns with two half hitches is a stronger variant.



Clove hitch – Used to tie a small rope to a spar or large rope at right angles. Where security against slipping is important, make it with a long end and add two half hitches in the manner of the round turn and two half hitches.

Double sheet bend – Used in place of a single bend when tying a small rope to a much larger one; or where ropes are likely to become wet or greasy.



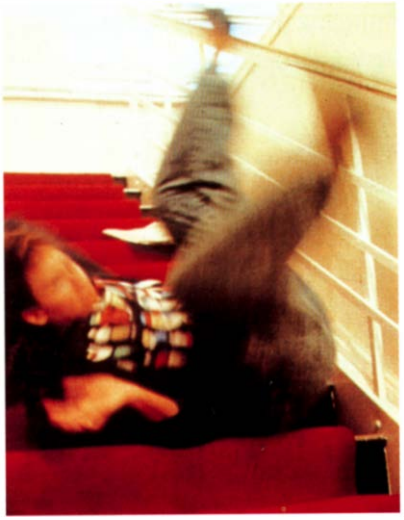
Warning! Do not use this knot; it is always liable to slip.

Do not turn a blind eye to hazards and defects – they might put someone at risk. As mentioned earlier, potential sources of hazards are not only faulty plant, mechanical aids, vehicles or defective tools, but also situations such as a missing light over a stairway or a patch of oil underfoot.

If it is something you can deal with yourself, do so. Otherwise, report it, doing what you can to reduce the risk in the meantime. Do not overlook the A646 procedure **[15]** which will be appropriate for unusual defects and difficulties with plant in service or defects in stores items.

Sometimes temporary action may include marking a hazard. Barrier Tape, Label Catalogue A290000 (adhesive) A290240 (non-adhesive) is available for this purpose. For mobile people there is the more convenient form (Label No. 554), which is a Stores Vocabulary item.

Do not use this tape for other than its intended purpose.



Report accidents

If you are injured on duty you should report it by telephone to your local Accident Reporting Group who will record the details in the accident book. You must also tell your manager who will then supply you with an accident form to be completed. All accidents, however trivial, must be reported.

Certain dangerous occurrences, listed in ISIS SFY/LAP/A011, must be reported to the enforcing authorities. This is done by the Accident Reporting Group who must be notified by the line manager immediately such an occurrence happens.

To the rescue

First aiders

Prompt first aid may save a life or lessen the consequences of injury. External people especially should be able to help in this way. Are you a first aider? If not, official training is available *free and in official time* at management discretion. For further details contact your Zone First Aid Organiser.

Casualties

If an injury occurs make immediate use of any first aid services available. For obviously serious injuries call an ambulance – unless the injured person is a 'walking' or 'sitting' casualty and its clearly quicker to use available motor transport. With suspected heart attack, gas poisoning or severe bleeding, inform the ambulance service accordingly, so that they can come prepared.

Do remember that for an incident in a manhole, the first priority is to obtain help and in an electrical accident to deal with any risk of electric shock to rescuers.

About casualties in traffic accidents

There are no set rules – only commonsense priorities and basic advice:

• *Do not* just rush to a crashed vehicle and start pulling people out – injuries could be worsened unnecessarily.

If other traffic threatens further danger, first do what is practicable to protect the scene, such as, enlist the help of others to wave down traffic some 400m on either side, or use any roadworks guarding equipment that is immediately accessible.

Assess the accident itself – how many people involved. How many trapped. Vehicle position(s) and

so on. Stop passing vehicles and send them in opposite directions to use the 999 service and pass all the situation information to the police. The police will alert other emergency services as necessary.

On reaching a crashed vehicle, ensure that it is stable, turn off the ignition and lights. If necessary disconnect the battery. Impose a no-smoking ban.

If casualties are in no immediate danger and are able to breathe, leave them in the car(s) until trained help arrives. *Do not twist, turn or move them.*

If casualties are lying on the road place blankets or coats underneath them; it is best to leave them there and take steps to guard them from traffic. However, the safety and care of the casualty are of the greatest importance and if it is necessary to move the injured person urgently from the roadway because of danger, it should be done as carefully and gently as possible.

First aid reminders

Do not move a seriously injured person if this can be avoided, unless resuscitation or recovery position is necessary.

If the casualty must be moved *handle with great care* particularly if the victim complains of back pain or when broken bones are suspected.

If a casualty is not breathing send immediately for an ambulance and start resuscitation immediately it is safe to do so.

Stop bleeding with sterile dressings or clean handkerchiefs and firm manual pressure. Elevate the limb if possible and bandage firmly with a handkerchief or scarf.

If there is a foreign body, for example, glass in the wound, press alongside and not directly on the wound.

Qualified first aid or medical aid should then be obtained.

In the case of burns, the aim of first aid is:

- to reduce the local effects of heat;
- to prevent infection of the affected area;
- to remove a severely burned or scalded casualty to hospital as soon as possible.

Cool the affected parts with cold water where possible, especially in the case of smaller burns, placing the part under slowly running cold water for at least ten minutes.

Do not attempt to remove burned or charred clothing from a wound before covering it with a sterile dressing.

If a chemical is the cause of burning, immediately flood the affected part with water and continue to do so, for at least twenty minutes. Contaminated clothing must be removed carefully.

Keep the casualty lying down and protect from the cold with rugs or coats, under and over the casualty.

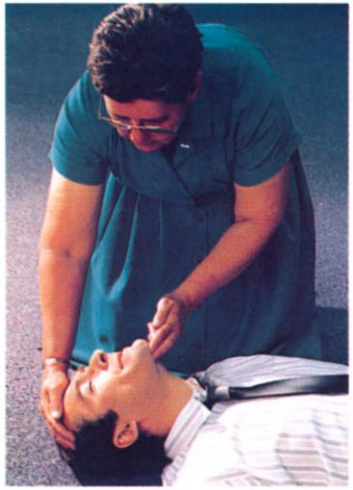
Unconscious casualties should be placed in the recovery position.

This will prevent the tongue from blocking the airway and allow vomit to escape freely. Make sure that the airway is clear.

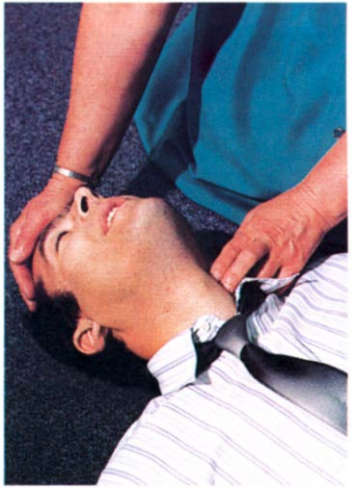
Do not give anything to drink – do not leave an unconscious casualty. Check breathing frequently.

Seconds count

- Start resuscitation as soon as it is safe to do so.
- Send for an ambulance without delay.
- 'Shake and shout' to check if casualty is rousable.
- If no response remove obvious obstructions from mouth.
- Open the airway by placing two fingers under the casualty's chin and lift the jaw. Place your other hand on the forehead and tilt the head back. Maintain this airway whilst completing the following checks.

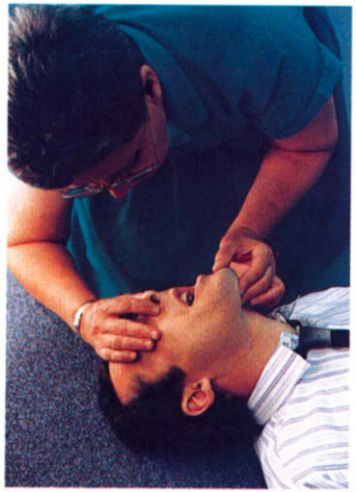


- Check for breathing by looking for chest movement, listening for sounds of breathing and feeling for breaths on your cheek. Do this for five seconds.
- Check for a pulse by sliding your index and middle fingers into the hollow between the 'Adam's apple' and the adjoining muscle. Feel for five seconds.



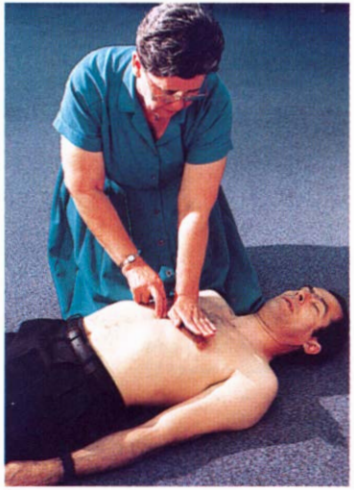
Casualty not breathing - pulse present

- Maintaining an open airway, pinch the nostrils closed with index finger and thumb.
- Seal your lips around the casualty's mouth.
- Blow until you see the chest rise. (If the chest fails to rise, adjust the open airway position and try again.)
- Remove your mouth and allow the chest to fall.
- Continue breaths at the rate of ten per minute.
- Recheck the pulse after every ten breaths.

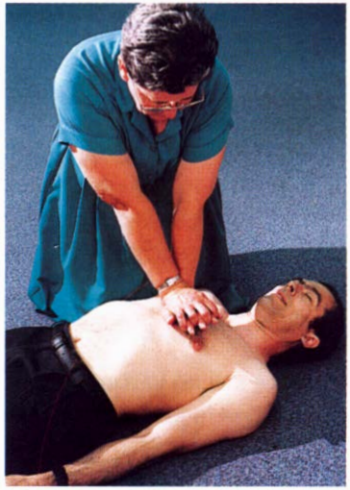


Casualty not breathing - pulse not present

- Give two breaths of mouth to mouth ventilation.
- Ensure the casualty is on a flat surface.



- Locate the junction of the bottom of the ribs and the breastbone, and two fingers breadth above this point place the heel of the hand.
- Bring the heel of the other hand down over it and interlock your fingers.
- Keep your arms straight, press vertically down to a depth of 5cms (1½" - 2").
- Release the pressure. Repeat at a rate of 80 per minute.
- Combine with ventilations at a ratio of two breaths to fifteen chest compressions.
- Do not make further pulse checks unless there are signs of a return to life, ie. a 'stirring'.



Reaching things safely

The right access equipment

If, with both feet planted firmly on the ground or floor, you cannot reach the work point comfortably, choose appropriate access equipment and use it correctly. *Never resort to precarious improvisation* such as stacked materials, a bucket, dustbin, springy chair or whatever.

It can be a short step to a heavy fall.

Where there are no permanent access facilities to enable you to do the job, it is for you to choose and use the most appropriate access equipment. Key points are the reach required, environment, stability and security of equipment, and your own footing and balancing. A special point to remember is that when a cartridge-operated tool is to be used, a scaffold is preferable to a ladder, steps, or step-ladders.

Never use defective access equipment. Have it repaired or replaced – if it is something you cannot correct yourself.

Be sure to carry out day-to-day, or (where appropriate) before use, checks. Oil your ladder safety-catch regularly.

What to check

With wooden items, look for splits, cracks, decay, splintering, loose treads, rungs, tie rods, screws or fittings and worn step cords.

With aluminium look for cracks, bends or distortion, loose and worn rungs or treads; blocked ladder-insert drainage holes and sticking fittings. If in doubt consult your line manager.

Do not use ladders, steps or staging which have no BT Serial No.

Type of access equipment	Reference	Ask yourself
Ladders	[8]	Do you have the items
Steps	[8]	appropriate to your duty?
Step-ladders	[8]	Do you know where to
Travelling ladders	[8]	get back-up items or
Portable staging	[8]	specialist help?
Hydraulic platforms		If you are a surveyor, do
Scaffolding (builders)		you note and pass on
Kit staging nos 1 and 2	[14]	access problem warnings?
Radio mast access	[18]	
Meter photography	[20]	
Portable ladders at radio stations	[18]	

Do not loan your equipment to anyone other than BT personnel and then only for official work.

It is permissible to use Customers' access equipment when circumstances are such as to make this a sensible thing to do. For example, it is safer, and, therefore, more sensible to use a customers' fixed loft ladder than to attempt entry to a loft from steps.

Always check it thoroughly before climbing. Do not use it if you suspect its condition or if it is not really appropriate to your needs.

. . . special circumstances on industrial premises

There are some special agreements with a few industrial customers where for purposes of unusual access difficulty or hygiene, the customer's special access equipment is used. If this affects you, know and obey the customer's safety rules; and, with ladders, steps and other such common items, remember to examine them before use.

Some factories have permanent access routes for service purposes. Do not use such access if it appears inadequate or unsafe – see the customer's safety supervisor. Observe any 'Permit to Work' scheme applying to such an access facility.

. . . builders' scaffolding

Before venturing on to scaffolding be satisfied that it is sound, stable and has the regulation safeguards. Check if the site office holds a valid current, certificate of examination (not required in all circumstances). If not, ask the site officer the necessary questions.

. . . obstacles, unforeseen and unusual problems

Obstructed access causes accidents. Have any movable obstructions shifted out of your way. Otherwise, as with unforeseen access problems with which you are not equipped to cope, summon the necessary official assistance or equipment as appropriate. Exceptionally, in a factory you can contact the factory safety supervisor for help.

You could meet an access problem for which there is no guidance in instructions or one where re-arrangement of BT plant looks like the best answer. If so consult your line manager.

. . . other thoughts

Handling access equipment, like any manual handling task, needs sufficient people and correct handling methods with due allowance for environmental obstructions and for the weather. Remember to wear properly fitting and substantial footwear for climbing up. Wear a safety helmet and keep clothing properly buttoned, when aloft.

A few Do's and Don'ts

- **Do** handle any ladder carefully.
- **Do** avoid using a single short section of aluminium ladder – especially indoors. Use steps.
- **Do** load onto a vehicle in the approved manner.
- **Do** fasten properly on vehicle carriers.
- **Do** store in cool dry place
- **Don't** drop a ladder violently or throw it down carelessly.
- **Don't** use light or extension ladders in place of pole lifters.
- **Don't** ever use as an improvised skid, bearer or horizontal bridge.
- **Don't** ever mount an upright ladder which is unsupported at the top – even if it is held by several people.
- **Don't** lash two ladders together as a way of gaining height.

Get an official ladder

Choose a ladder of the right type and of adequate length for the job.

Ladder Light 16' 6"

3.5m – 6.55m (11' 6" – 21' 6")

Extension, 2-Section, Wooden

No 1. 4.27m – 7.62m (14' – 25')
No 2. 5.49m – 10.06m (18' – 33')
No 3. 2.74m – 4.8m (9' – 15' 9")

Extension, 3-Section, Aluminium

No 4. 2.18m – 5.23m (7' 2" – 17' 2")
No 5. 2.54m – 6.17m (8' 4" – 20' 3")

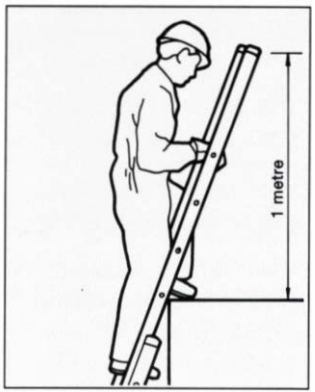
Reaching comfortably

With an overhead landing or working platform or surface level at an excavation, stiles must reach lm (3ft) above the landing level – with the ladder top lashed where possible.

Shift your ladder and adjust its reach position to maintain a comfortable working position.

When working from the ladder do not reach more than a comfortable arm's length beyond the style.

When fixing dropwires the ladder must be positioned to enable the dropwire to be pulled into place, without twisting the trunk of the body.



Lifting and carrying ladders

When lifting a ladder, observe the normal basic rules of safe lifting.

With a small ladder, take up your stance close to one side, towards the top. Turn it up on one stile, bottom section of an extension ladder towards you. Lift the top until it can be supported on the shoulder. Slide the shoulder down to the point of balance.

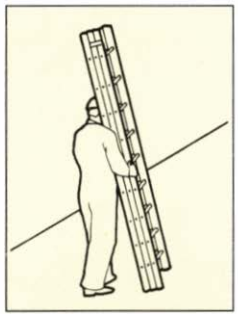
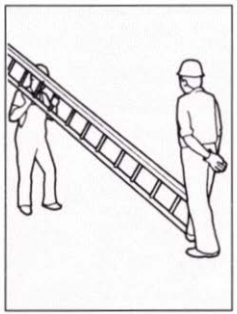
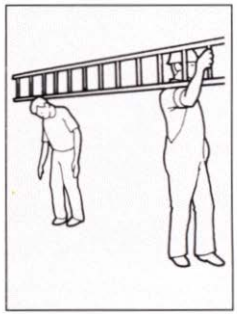
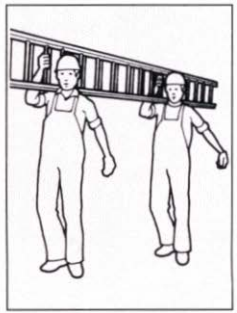
Except for a No 2 extension ladder, longer extension ladders can usually be lifted by one person, but it is best that the foot of the ladder be blocked, if necessary by a second person.

Where two people are to carry a ladder, a No 2 extension ladder, for example, both lift one end on to one persons's shoulder, then the other lifts and shoulders the other end.

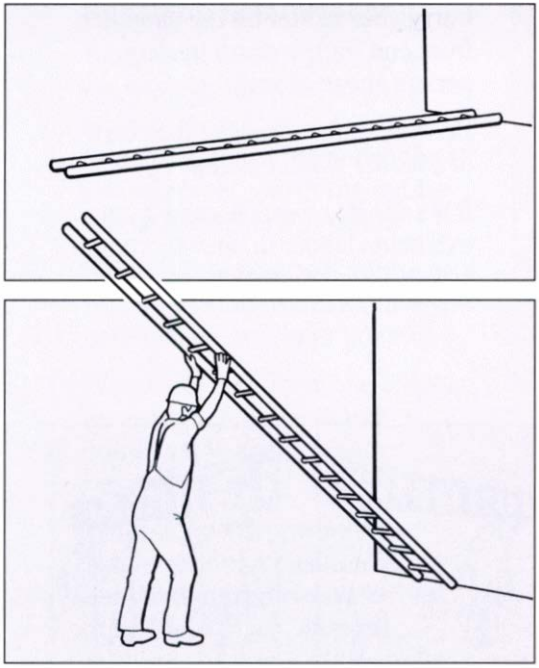
Carry your ladder on the shoulder, front end high enough to clear a person ahead of you.

Be wary of the sweep of the rear of a ladder when turning.

It is safer if two people carry a long extension ladder in busy thoroughfares or in restricted spaces.

Principles of correct ladder erection

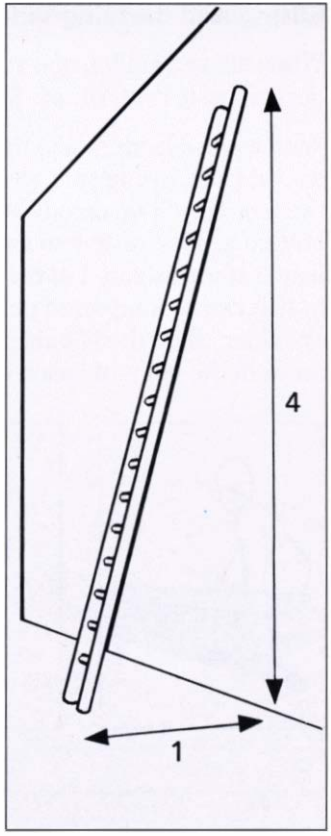


The principles behind all ladder erection can be illustrated by considering the simple erection of a single ladder against a wall. Remember, you need a firm, reasonably level footing for the bottom of the ladder during erection. Always select a strong and rigid top support. With the smaller light ladders it is possible to rear the ladder against a wall (or pole) straight from the shoulder.

An alternative universal approach is to lay the ladder flat on the ground, ladder foot butted against a firm support.

Lift the top above head height and raise upright in the way shown.

Set at the recommended angle, checking that top and bottom are firm, with stiles evenly supported. Level the base if necessary and secure where possible.



Small extension ladders

Place the closed ladder upright below the access point with the ladder foot fairly close to pole or wall. The ladder top can be rested against this support when necessary.

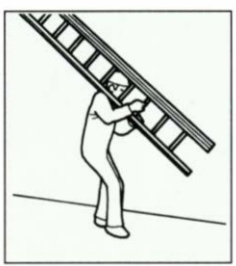
Stand facing the left-hand side of your ladder and support it in an upright position (a left-hander may prefer to work from the other side).

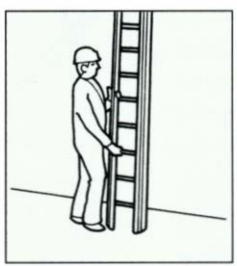
Ease down – maintaining a good lifting posture – unlatch the safety catch and start extending the top section as you rise. If you prefer, you can rest the top section base on the ground while you rise.

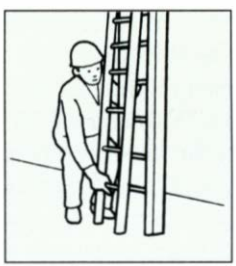
Extend the top section in easy stages, then the second section. If you need to, rest the head of the ladder against its support temporarily.

Watch the head of the ladder as it rises and nears the required height. Do not forget to allow extra height for re-setting to the correct angle.

If your ladder has a top roller fitment, the ladder top can lean against its support throughout since it can be rolled up the support. Wear eye shields in such instances as protection if debris is dislodged.







Medium extension ladders

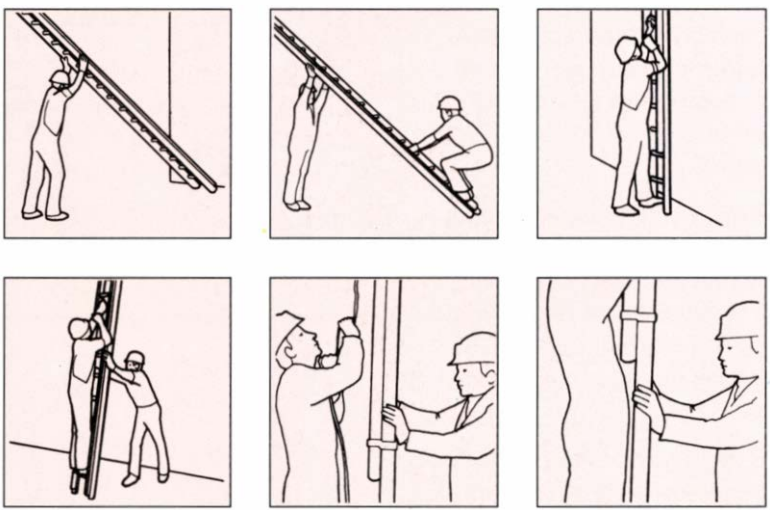
With unobstructed access you can erect the closed ladder on your own. Pull the base out about one foot and check that both stiles are reasonably level.

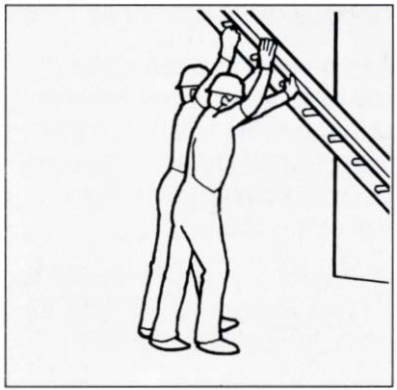
Space restrictions may require two people to erect the closed ladder as shown, and to manoeuvre it into the required position. With one leg pushed against the lower rungs and forearms at head height, rope up the top section. Watch the ladder top as it rises - wear eye shields.

To negotiate an overhanging obstruction, extend to just below the obstruction and pull out the ladder foot sufficiently to enable a second person to support the ladder clear of the obstruction. Note the rope operator's 'footing' position.

Rope up gently as the guide brackets near the second person's hand. Stop at their command – so that they can change grip.

Where there is no intermediate support for the ladder-top, a second person must support the ladder from the rear throughout. Note that the person on the rope cannot assume the 'footing' position until the ladder is extended by two rungs.





Heavy extension ladder

In a clear uncomplicated situation two people working in unison can erect a closed Ladder Extension No.2 against a wall, ready for extending it. One person ropes up the top section as previously described but must 'foot' the ladder as shown when the two bottom rungs are clear. The second person can support the other if necessary.

With restricted space, overhangs, and the like, two people support the ladder from the rear during roping up. Only one should give directions, to ensure that there is no confusion in negotiating the ladder guide brackets.

Ladder stability

Do not use bits of brick, scrap bits of wood and the like, to level a ladder foot. These can all too easily move or collapse due to the movement of a person aloft.

If practicable dig-in the bottom of one stile taking care that the bottom of the excavation is firm.

Levelling the foot

Otherwise use the officially issued packing pieces in a suitable combination but be careful not to use the thinnest slab 6mm on its own to bridge a depression.

Getting the angle right

Any ladder which cannot be lashed or otherwise secured at the bottom, must be set at this angle with the tops and bottoms of the stiles evenly supported, before it is climbed.

Remember: The ladder should be 300mm (1' 0") out at the base for every 1.2m (4' 0") of height.

If there is a vertical line indicator on your ladder, line this up with the support wall or a convenient vertical structure. If not, take the vertical height as being the length of the ladder. Count the 250mm (10") rung spacings and pace the spread of the base. That will be near enough.

Securing ladders – ways and means

Ways of securing ladders

Always lash a ladder top and bottom wherever practicable.

Lashing the bottom does not reduce the need to level the ladder base.

You must secure the bottom of a ladder where the recommended angle is not possible.

You must secure the bottom if you are doubtful about the ground conditions.

You must secure the bottom if there is a risk of pedestrians or animals bumping against, or high winds moving, your ladder.

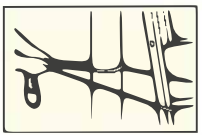
You must lash the top if the ladder is erected against a pole.

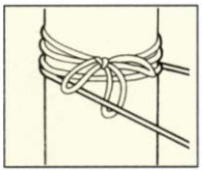
Bottom lashing with ladder tie

1 Pass the tie around behind the ladder.

2 Terminate each end on the fourth rung.

3 Draw the rope back level in two bights against the pole.





4 Tie off.

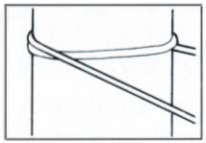
5 Give final tension by pulling out the ladder bottom.

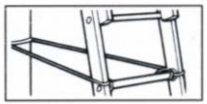
Note: This method can be adapted to other circumstances.

Bottom lashing with sash line

1 Make one end of a sash line round the right-hand stile and fourth rung.

2 With line taut take one and a half turns around the pole.

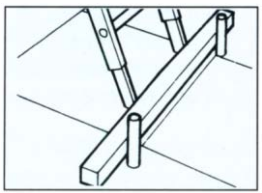




3 Make off around the left-hand stile and fourth rung.

Note: Again, this method can be adapted to other circumstances.

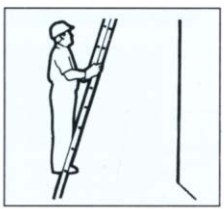
Blocking the foot



Both stile bottoms must be firmly restrained.

Blocking can often be employed on wall work where lashing is not possible.

Footing



The 'footer' simply stands with both feet firmly on the bottom rung of the ladder.

The person must stand in that position *throughout the time the other person is climbing, lashing the top, working from it or descending. The person must not step off* until the climber has descended as far as possible or has climbed up onto the supporting structure. 'Footing' is a MUST unless a ladder has been otherwise secured – by lashing, or blocking, or when using a stable ladder at the correct angle.

Ladder Feet No lA [14]

These are intended mainly for indoor use to give additional security on polished floors and other smooth surfaces.

Rules to observe:

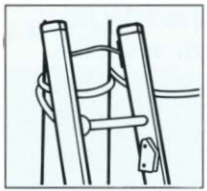
- Take care to prevent contamination with oil, mud, etc.
- Clean frequently to remove any incipient build up of polish.
- Use only on dry surfaces.

Top lashing

Although methods are depicted in terms of lashing to poles, these can readily be adapted to other supports, for example scaffolding.

...captive rope and clam cleat:

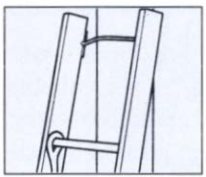
1 Unfasten rope from stored position.



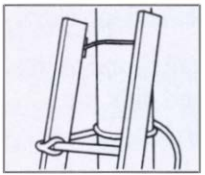
2 Keeping taut take one and a half turns around the pole.

3 Pull into clam cleat and pull tight.

Captive rope only

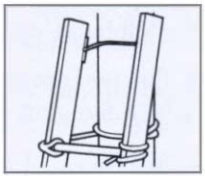


1 Unfasten rope from stored position.



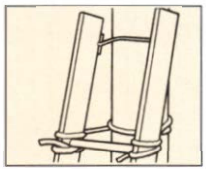
2 Keeping taut take one and a half turns around the pole.

3 Make off around the right hand stile and top rung.



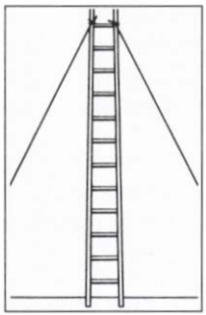
...separate rope

Simply make off the end of a short length of light rope or sash line around the left-hand stile and top rung. Then proceed as for a captive rope.



Top staying

Where the top of a ladder cannot be lashed and where this is a problem, side staying may be possible. Erect the ladder with one end of a length of rope made off around each stile and top rung. Run each of these guy lines out diagonally to left and right and secure to convenient anchorages.



Double lashing for one-person application

This is an alternative method which allows one person to lash a ladder to a pole securely top and bottom, while working ground level.

1 Erect the ladder with one end of a light rope already made off round the right-hand stile and top rung.

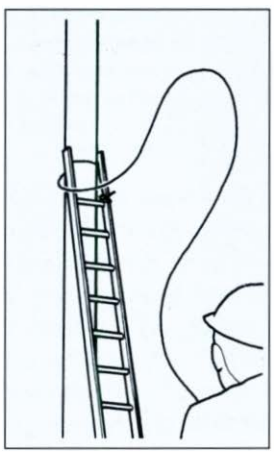
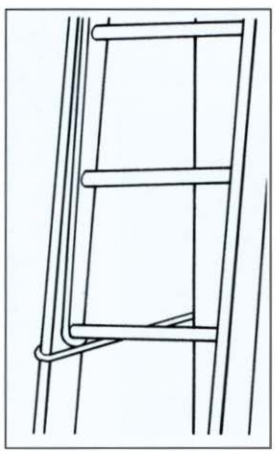
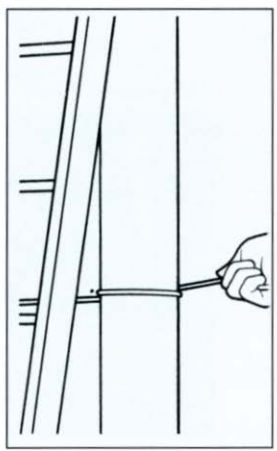
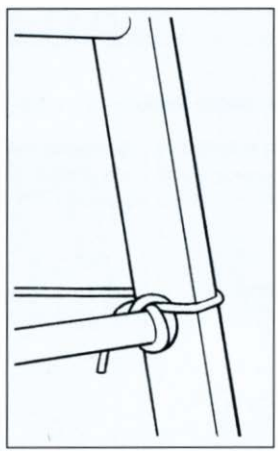
2 Take the rope tail round to the back of the pole and flick the rope over that stile top.

3 Now take the rope tail right round to the front and flick it over the left-hand stile top.

4 Pull taut down the face of the ladder and under the fourth rung. Take one turn around the left-hand stile and back under the fourth rung.

5 Keeping rope taut take one and a half turns around the pole at a point level with the fourth rung.

6 Pull tight and make the rope off securely around the right-hand stile and fourth rung.

On or working from a ladder

Climbing

Use the fireman's method. Face the ladder, grip the rungs and climb unencumbered.

Move hand and foot on the same side in unison; get the instep well forward on the rung, keep an erect stance and do not let your arms come above shoulder level.

Do not use stile tops as footholds to gain extra height – increase the ladder reach or get a longer ladder.

Working

Only one person should work from a ladder; but consult **[8]** for the rare exception and the special precautions involved.

Do not reach more than a comfortable arm's length sideways.

Do not exert heavy side pulls unless the ladder is properly lashed.

Do not work from a rung higher than the fourth from the top; it is difficult to maintain a comfortable posture and secure balance.

Special circumstances

To handle or use ladders anywhere near overhead power distribution, you must be familiar with **[16]**. You must also be familiar with it, where joint electricity and BT construction exists.

The following points are emphasised:

- it is unsafe to move an extension ladder in an upright position. Always lower it before moving it from one site to another;
- a ladder must not project above the uppermost BT wire or cable, on a jointly-used pole;
- do not erect a ladder against a pole with electric power fittings – other than power cable running vertically or a lighting bracket – below BT wires or cables;
- ensure that fuse covers are in place and intact before placing a ladder against a joint user pole;
- do not let a ladder come into contact with metal-work associated with a power system;
- do not leave any ladder unattended when erected against

a jointly-used pole whatever the circumstances;

- be sure that the ladder inserts on an aluminium ladder erected against a jointly-used pole do not sink into soft ground.

Work on railway property is subject to special rules – see **[17]**

Where there is an electrified line do not use BT's standard extension ladders. Use only approved wooden ladders when working on BR sites. It may be necessary to borrow British Rail's equipment.

Stowage on vehicles

Always load or unload in the manner prescribed for the type of vehicle concerned – see the relevant instructions.

- Be sure that the sections of an extension ladder are securely located together.
- With roof mounted ladder-carriers on small vans, do not leave a rear projection which might constitute a hazard to the public.
- Never drive a vehicle with an unsecured ladder-carrier.
- Fasten the ladder or ladder pile securely, front and rear.
- Ladder securing chains are for overnight parking. These are not to be used in place of ordinary securing devices.

Storage of ladders

- Do not store in a battery-room or near heating pipes.
- Store outside – under cover, out of the sun, or in an unheated building but not under a glass roof.
- Use proper official storage where available.

Now about steps

Care of steps

- **Do** handle steps carefully.
- **Don't** drop, or throw them down violently.
- **Do** examine steps frequently for defects.
- **Don't** ever use unserviceable steps.
- **Do** clean treads that look slippery.
- **Don't** paint or varnish treads.
- **Do** stow, and fasten properly in correct position, on vehicles.
- **Don't** carry wooden steps on an external ladder-carrier.
- **Do** store wooden steps in a cool dry place.

The right steps

Use the right type and size for the job.

Official steps provide for access to work points at heights up to 3.660m (12ft).

Only aluminium and folding

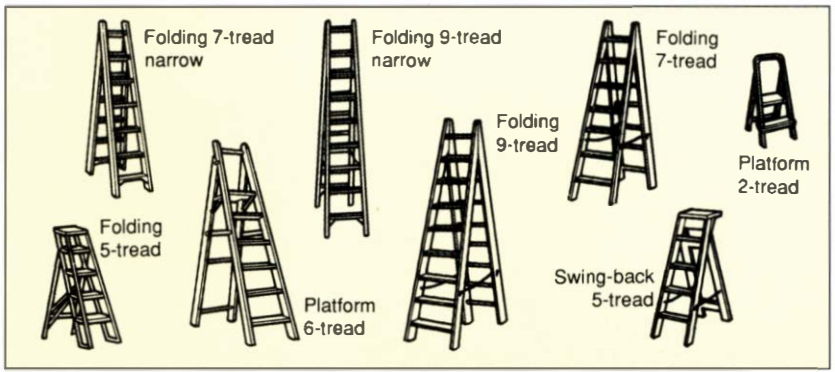
5-tread steps are for external use, but do not expose the latter to wet weather.

Do not take aluminium steps into an apparatus room.

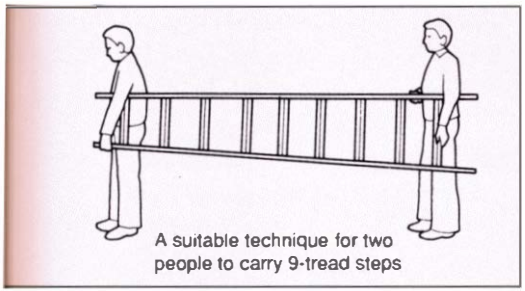
Folding 5-tread steps are intended for casual use in and around customers' premises and are designed to fit into 250kg vans. Do not keep them for permanent use in heated buildings.

Platform 6-tread steps are also for casual use on customers' premises but by parties with 750kg (15cwt), or larger, vehicles.

Platform 2-tread are for use by staff on kiosk work.



Carrying

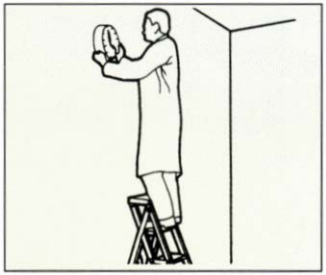


A suitable technique for two people to carry 9-tread steps

Carry 5 or 6-tread steps in an upright position resting against a shoulder. Tilt the top forward to negotiate restricted head room. Over short distances 7 and 9-tread steps can be carried similarly; but, seek help when negotiating cramped conditions, traversing passageways etc.

Erecting

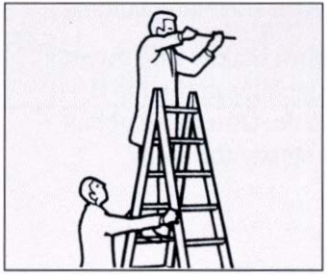
Always position steps to ensure comfortable access to the work point. Make sure that the feet are spread fully and evenly supported. Never use folded steps in the mode of a ladder, or support the steps on boxes to gain extra height.



Wherever practicable, place steps at right angles to the work - to avoid side thrust from working operations.

Protection

Where steps must be erected such that they are vulnerable to bumps (for example in a busy factory aisle), guarding is necessary. Use whatever guarding equipment is immediately available and, if required in exceptional circumstances, get an attendant.



Take account of opening doors, blind corners, pedestrians, and other hazards.

Working

Climb, unencumbered as far as possible, facing the steps. Do not work from the top tread of steps which have no top guard rail. Do not over-reach, drop wire ends underfoot leave tools on treads, or create any other such hazard.

The procedure for jacking out equipment while on steps is the same as for travelling ladders.

If the work makes side thrust unavoidable, lash the top if practicable. Otherwise obtain help to steady the steps.

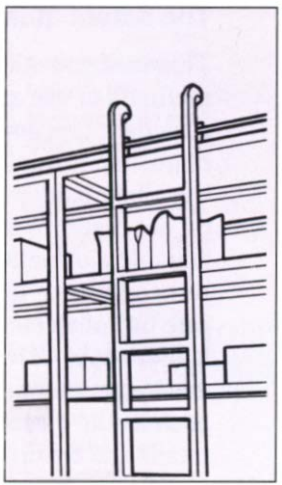
And step-ladders

These are simply single-section ladders with flat treads – only the hook-on type is used by BT. The general rules for safe use of ladders and steps are therefore applicable as and where appropriate. There are, however, some particular precautions to observe.

Use only in the specific situation for which it is designed. Ensure that the support hooks are fully engaged on the overhead rail and both stiles firmly on the floor.

Never climb or descend with a load requiring both hands. Get help or use a mobile safety platform.

Do not leave a step-ladder erected and unattended where it can be a tripping hazard. Park it on the lower hooks.



Travelling ladders

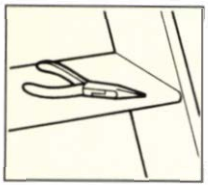
The safest of ladders

That is, if you stick to the correct methods of use and observe the attendant precautions, the risk of mishap is minimal. Where travelling ladders are provided, do not resort to using less suitable alternatives. But remember, the general rules for safe use of all steps and step-ladders apply. Do not neglect the day-to-day attention to ladders – such as the cleaning of slippery treads and ensuring the treads are dry. Report defects immediately.

Tie a faulty ladder in the parked position and display this notice.

Always descend first before re-positioning your ladder. *Never put a foot through the ladder onto the brake release* so you can just pull yourself along.

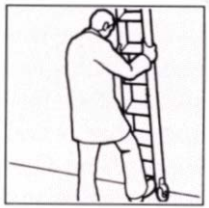
Do not move an unparked ladder until you are sure that it is unoccupied and there are no loose items on a tread.



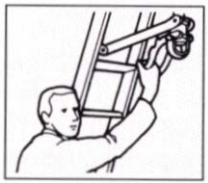
Climb facing the ladder. *Never descend facing outwards.*

Handling and climbing

Always park a ladder if it is not immediately required for use.



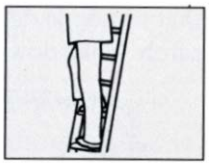
Position a ladder carefully to ensure comfortable access to the work point.

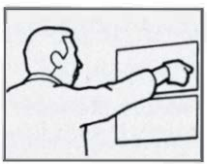


Working and Wiring

Only one person at a time may occupy a ladder.

Get comfortable. Turn on the feet. Do not twist the body.

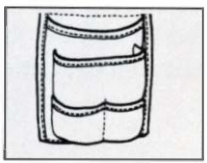




Reach only an arm's length sideways – and half that when pulling jumper wires.

Use belts-pocket when wiring.

Prevent risks from debris and loose tools underfoot.



Jacking out equipment

Turn on the feet towards the equipment; do not twist the body.

Jack out the unit (one hand underneath, the other hand in front with fingers over the top).

Turn bodily back to face the ladder, steadying the equipment on a tread to help balance.

Descend in stages, steadying the load against a convenient ladder tread.

About cat ladders

This section is concerned with low-rise cat ladders. Those on radio masts, towers and similar tall structures are subject to special regulations.

Cat ladders are fixed or hook-on, vertical or near vertical, iron ladders. They are used to give access to and in some cases a means of escape from roofs, cable lofts, lift plant rooms, cable chambers and trenches, lift wells, manholes etc. They are also encountered on customers' premises.

Always climb unencumbered, grip the rungs and keep an erect stance. With hands at about

shoulder level and instep well forward on rungs, climb unhurriedly moving hand and foot on the same side in unison.

Loft access

Adopt a firm erect stance and get a good grip on a high rung. Then step up as you open the trap to its fullest extent. Do not forget to switch on the light first where possible.

Get a good grip with both hands before stepping on or off at the top. *Never* stand on

trap doors; most are not designed to take the weight.

Keep the area around a ladder foot (or head) clear. Remember that someone descending a ladder rarely looks down.

Be alert for damage and defects. Report these promptly.

Never use a ladder that is obviously unsafe.

Do not attempt to work from a cat ladder unless you are properly secured by a safety belt.

Roof access

When getting on to a roof from a ladder or through a trap door, maintain firm handholds and be prepared for sudden gusts of wind. When getting back on to descend, keep a firm grip, look and feel for the top rung.

Cable chamber access

Be sure to guard the entry and to do the necessary gas tests. When the trap (or panel) is open fully, lock it back (or move panel to a safe place) – take care of fingers and toes. Descend using both hands to hold the grab rails.

Seldom used escape hatches can be hard to open. In an unfamiliar cable chamber it is a good idea to go through a familiarisation drill. A firm grip and stance on the ladder plus care and protection against falling grit is required.

Manhole access

Enter and leave in this fashion. Wear gloves. If the manhole ladder must be moved to afford work access, re-position and secure it vertically, as convenient, in the shaft. *Only use this arrangement to get out in an emergency.*

On customers' premises you will encounter cat ladders of widely varying standards.

You must:

- have the customer's express permission to use that route;
- never use the ladder without the customer's knowledge;
- observe any special conditions set by the customer;
- be sure that the ladder is safe.

A modest step up . . . or a greater height

Low reach portable staging

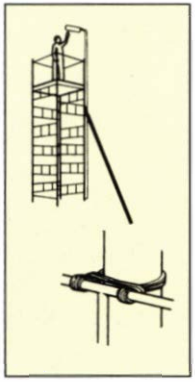
This provides a working platform of modest height (up to one metre) in a variety of work situations – high cable joints in cable chambers is but one example. The platform can serve as a crawl board.

Know from where these are available. Select the size to suit your job. Strap it securely for transportation [8].

Make sure that the legs are pulled over the platform up to the rubber stops with the feet spread outwards to their fullest extent. The platform must be firm and stable. Should you have to ascend or descend via the support legs, *face inwards* and make use of any nearby good hand holds.

Tower Scaffolding (Kits Staging)

- Base firm and level.
- Tower vertical.
- Lashed to an adjacent structure, if possible.
- Supported by outriggers, if possible.



All tower structures can be unstable unless they are on flat, level surfaces, have a well stabilised base and are always strictly vertical. Anyone who has to erect or use Kits Staging must be familiar with [14].

Reminders

1 Always fit the guard-rails and toe boards which is a legal requirement.

2 Move the tower carefully – from the base. Make sure no-one is on it.

3 Take care to avoid fouling overhead obstructions [14].

Radio masts, towers and the like

There are numerous types of hazards associated with these structures and the safe working techniques are usually only familiar to trained radio people. In any event, to gain access *you must first consult the authority in charge of the structure* – the name and telephone number is shown near the base **[18]** & **[19]**. They will issue a permit to climb and:

- inform you of any hazards and limitations to your movements while aloft;
- ensure that you have the know-how to use an appropriate safety belt or harness;
- arrange surveillance.

You must not climb alone, that is, without visual or audio contact with someone else in the vicinity **[18]**.

You must read ESG 9 before starting work.

Index of contents

This is the ABC of general safety precautions. But, always remember that official instructions are the overriding authority.

ISIS references

The symbol **[N]** *denotes the relevant ISIS document.*

ISIS Symbol	ISISNumber	General Subject
[1]	SFY/LAP/B010	Health and Safety at Work Act 1974
[2]	SFY/CSP/B032	Compressed gases, cylinders in MT Workshops
[3]	SFY/CSP/B031	Fluids under pressure - Hazards
[4]	TMA/APN/A038	Air cylinders - Trolleys for
[5]	SFY/LAP/B016	Dangerous Substances Packaging and Labelling Regulations
[6]	SFY/CSP/B020	Lead - Hazards and their control
[7]	SFY/CSP/B050 to SFY/CSP/B060	Asbestos
[8]	SFY/CSP/A100	Abnormal hazards on customers premises
[9]	SFY/CSP/C011	Management of Safety
[10]	SFY/CSP/A018	Customer Safety Systems. Rules, Permits and Procedures
[11]	BES/LLE/B351	Lifting gear
[12]	BES/LLE/B353	Webbing slings
[13]	BES/LLE/A303	Lifting equipment
[14]	TMA/TAM/A021	Belt Safety No 3
[15]	BAN/MAP/A150	A 150 Management of Corrective Action
[16]	SFY/CSP/A030	Power Cables [UG] Safety Requirements
[17]	SFY/ESP/A011	Crossing railways
[18]	TMN/RSM/A080	Temporary lifting rigs at radio stations. Testing
[19]	TMN/RSM/B020	Radio Clerk of Works Engineering Manual
[20]	TMA/TAM/A010	Tools and Accessories Manual

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