Crawler Tractor Dozer

General safety information for CPCS technical test
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Health and safety at work act 1974 – designed to protect people and the environment from work place activities. It places certain duties and responsibilities on employers, employees, self employed people, designers and manufactures.

- **Employers responsibilities** - must ensure workplaces under their control are safe and free from hazards. Ensure the safety of employees, self employed, visitors, trespassers and the general public who could be affected by the work. Everything they provide for use, tools, plant and equipment must be fit for purpose, safe to use and the personnel trained to use it

- **Employees responsibilities** - must take care of them selves and others who may be affected by their acts or omissions. Co-operate with their employer. Do not tamper with or interfere with or misuse anything provided for safety

- **Failure to comply with legislation** - could result in loss of your job and all the financial implications that can bring but it could also result in prosecution. The severity of the breach of legislation and any accidents or incidents related will dictate what type of court proceedings you could face. If you have fulfilled your legal requirements and can provide proof of this in court then you would likely be found Not Guilty but If you were found guilty you could face a prison sentence or a substantial fine

To fully understand the above Act specific training and guidance is required

**Method Statement** - detailed description of how to carry out a job safely and efficiently. All involved in the work must be briefed on its contents. Workers must follow the Method statement unless they feel it is not suitable then they should stop and report it and have the method statement amended. Method Statement must only be amended by competent people

**Risk Assessment** - is a legal requirement before work starts. It is a detailed assessment of the risk involved in doing and job and provides information on how to reduce the risk level down to an acceptable level.

**Hazards** - this is anything which can cause harm to people plant or equipment.

- **Excavations or Trenches** – risk of collapse. The minimum distance to keep away from open excavations is at least the depth of the trench i.e. if its 2m deep you stay 2 m back

- **Working at height** - any place you can fall from and be injured is considered working at height. The top of a mound, climbing into or out of a machine. Standing by the edge of a excavation

- **Overhead cables** - the minimum distance to be maintained from overhead cables mounted on wooden poles is 9m from the greatest reach of the machine and 15m from cables on metal pylons. Electricity can arc or jump a gap.

- **Confined spaces** - any where there is restriction on operating area can be considered a confined space. There is a greater risk of accident or damage. The Minimum distance which should be maintained between a fixed obstacle and the machine is 600mm (this is deemed to be the smallest distance a person can go through without being injured). if this distance can’t be maintained then the area should be fenced off and signs erected. Fumes, dust, noise, lack of visibility and insufficient room to manoeuvre are all hazards associated with confined areas

- **Plant operations** – are regarded as “safety Critical operations” because of the potential risk of an accident. Plant Operators can cause harm to themselves or other people if they carry out an unsafe act.

- **Pedestrian areas** - care should be taken when operating in pedestrian areas. A safe route for pedestrians should be provided with suitable signage and lighting. Enough room for material storage and vehicle movements is required. Noise, dust and fume levels should be reduced where possible. Required permits , method statements and risk assessments should be in place.

**PUWER – Provision And Use Of Work Equipment Regs**

This is an amendment to a European regulation. It deals with the use of plant and equipment and has specific requirements including
• **Restraint systems**- seat belts must be worn at all times to prevent injury in the event of the vehicle overturning

• **ROPS (Roll over Protection Structure)** - prevents injury in the event of the Tractor/Dozer overturning

• **FOPS- (Falling Object Protection Structure)** prevents injury from falling debris. If fitted to a vehicle then you do not need to wear the hard hat inside

• **Training and Instruction**- you must receive adequate instruction and training on any equipment before you can operate it

• **Fit for Purpose**- work equipment must be fit for purpose and safe to use

• **Information- Operators Manuals** and other information relating to the safe use of equipment must be with the equipment. This is to allow operators to check and gain necessary information. To fully understand PUWER specific training and guidance is required

**Environmental issues**-

• **Refuelling**- should only be done in a designated area. Clean containers and funnels should be used. Any spillage should be cleared up using suitable equipment. Waste should be disposed off in designated bins.

• **Condensation**- the machine should be refuelled at the end of the shift to prevent condensation building up in the tank as the machine cools down

• **Reducing environmental damage**- Operate safely, operate efficiently, Tip materials in designated places, don’t mix materials, Switch off when not in use, Don’t overfill when refuelling, check tyre pressures, report leaks or damage, clear up spillage, dispose of waste in designated bins. Follow method statements and COSHH assessments

• **Designated routes**- should be adhered too. This will avoid damaging unspoilt ground, or completed work, or unnecessary contact will other plant or people. Due to the weight of the Compactor there is an increase likelihood of sinking if not travelled on suitable ground

**Types of Dozers uses and limitations**-

- **Tracks**- used to propel the machine and compact the ground. Crawler tracks allow the machine to travel over rough and soft ground. LGP (Low ground pressure type machines), have wider tracks- The less pressure the ground can take the wider the tracks. **Blades**- Tractor dozers are fitted with blades which allow them to push, spread and level material.

- **Pat (push and tilt)** also known as a **six way blade**- It can be tilted or angled to a variety of different positions or angles by using the hydraulic controls in the cab

- **Angle Blade**- Moves horizontal either side of a central pivot point

- **Tilt Blade**- The tilt blade moves vertically either side of a central pivot point

- **U Shaped Blade**- Sides on the blade allow the dozer to carry material over large distances

**Changing a blade**- is a job for a trained and competent person. The blade must be resting on the ground to prevent accidents. Blade capacity is the amount of material a blade can move and is calculated by multiplying the height by the width of the blade.
Pre Use Inspections

- Plant should be checked according to the manufacturers specifications. The checks should be recorded in the defect book or daily check sheet. Any defects should be reported.
- Suitable PPE (gloves) should be worn when carrying out the prestart checks to prevent skin disease and contaminating the controls.
- Engine oil, Hydraulic oil, Transmission oil, Coolant, Brake fluid, Tyres and the condition of the Tractor/Dozer should be checked.

(Checks will vary depending on make and model always read the operators manual)

- If topping up with oil always do so in the designated area, use clean funnels and jugs or containers and clean around filler cap to prevent dirt entering the system.
- Most Compactors are fitted with a radiator to keep the engine cool. This is a pressurised system which pumps water around the engine keeping temperature down. Do not open a hot radiator or filler cap as the hot liquid inside will be released under pressure and could scald or burn.
- Some engines are fitted with turbochargers- Exhaust gases from the engine drive a turbine at very high speed. The turbine is connected to an impeller which's forces air under pressure into the induction manifold. This increases the efficiency of the engine. The turbo can run for a considerable time after the engine has stopped. The turbo is lubricated from the engine lubrication system. It is important to let the engine idle for a minimum of one to two minutes before switching off otherwise the turbo could suffer a loss of oil and seize up. (see operators manual for exact procedure)

- If operator maintenance or servicing requires the operator to work beneath the raised blade then the blade must be propped to prevent the blade falling down and crushing the operator.

- Mirrors- it is essential to maintain good all round observation when operating the Compactor. To assist the machine is fitted with a variety of mirrors, they must be adjusted properly, secure, clean and free from damage. Many fatalities have occurred on landfill sites because of poor driver observation. Mirrors only work if you look in them.
- Cameras- most Tractor dozers are fitted with reversing cameras to increase the field of vision, they provide vision in areas not covered by the mirrors and can also be fitted with volume allowing the operator to hear warning instructions. The disadvantage of cameras they can be hit when reversing, get dirty, and are affected by the glare of the sun.
- Tracks and Running gear-

  Always check the conditions of the tracks-
  1. The condition of the chains- no damaged or missing links
  2. The tension of the tracks- always read the manual
  3. Track pad or plates- all in place and secure
  4. Sprockets- for wear
  5. Front idler- no damage or wear
  6. Oil leaks- check around final drives for leaks
  7. Dirt and debris- excessive build up of dirt and debris can cause excessive wear on the running gear and can hide damage/defects
  8. Track guards- secure and in place, they are on the bottom of the track frame and help keep the tracks in line with the rollers and sprockets
  9. Rollers- in place and functioning
  10. Cleats/Grousers- provide grip if worn the tractor/dozer could slip
Plant Stability and Travelling

- **Travelling or operating** the machine affects the stability. Travelling across slopes, turning at speed, too close to excavations can all lead to instability and possible overturning. Soft or wet areas can cause the machine to sink or overturn.

- Check all around the Tractor dozer is clear before mounting
- Mount the Tractor dozer and fit seat belt (**Seat belt**) will secure operator to the seat and reduce potential injury in the event of overturning
- Start the Compactor
- Engage gear
- Sound horn to warn others in area
- Look all around to ensure its clear then release handbrake and move off
- Travel at a speed suitable for the conditions
- Brown field sites can be contaminated or have old services, voids or cellars

Operating on Slopes and Embankments -

- Ensure there is the tractor dozer has sufficient ground clearance and is capable of travelling on the slope, always check the manual for working angles and gradients
- Check the ground type for grip
- Ensure the area is free of obstructions
- Before forming a batter or embankment always know the required specifications and angles, beware of the machines capabilities, understand the type of material and how it handles - some materials may be sticky or difficult to level, have the relevant paperwork in place i.e. permits, risk assessment etc
- When working on a diagonal side hill cut the tracks should be angled uphill

Operating Techniques-

- Ensure the relevant Permits are in place
- Suitable signing, lighting and guarding to exclude unauthorised people
- Know the depth and position of the trench
- Check for services before starting to cut N.B. CAT scans do not detect plastic piping
- Have suitable provision for the storage or removal of the spoil
- Have a banksman
- Be aware of any proximity hazards in the area
- Have suitable equipment to check the depth of the trench – laser levels, boning rods, etc
- Dozers can be fitted with GPS levelling systems. The required levels are programmed into a laser system. The laser system is connected to the hydraulics of the dozer and this controls the depth and of the blade
- Avoid ‘Back Blading’ (dragging material backwards with the back of the blade) as this part of the blade is a non wearing part
- Reversing- good observation must be maintained at all times. Reversing at high speeds can cause excessive wear on the running gear
• Backfilling- care should be taken not to damage new or existing services by pushing in too much material. The trench edges could collapse underneath the dozer causing it to get stuck. Always align the dozer up before beginning to push as it may be difficult to change line when pushing. Always feather the blade before reaching the end of the push to help compact the material and avoid overrunning the trench.
• End of shift- always sign and barrier off open trenches to prevent accidents. Park the machine away from the trench edge.

**Parking The Tractor Dozer**

• Park on level ground
• In cold weather it is recommended to clean the tracks before parking to prevent freezing to the ground
• Do not block entrances or exits
• Do not park on soft or wet ground
• Do not block pedestrian routes
• Do not leave close to trenches
• Park brake on and out of gear with blade on ground
• Allow engine to idle for 1-2 minutes before switching off to allow turbo to slow down. Failure to do this could damage the turbo
• Remove key and isolate to prevent unauthorised use

**Transporting the machine**

• The transporter driver is responsible for the loading operations
• A level area with sufficient room to manoeuvre should be selected
• No overhead obstructions
• The machine should be clean
• The transporter should be suitable and in good condition
• The ramps should be adjusted to suit the machine and a winch used if necessary
• The operators manual should be consulted to find the loading procedures
• A banksman should be used
• The area should be free of people and other plant