
HEAVY EQUIPMENT

I. INTRODUCTION

Improper procedures used by our employees can cause injury, disability, or death. By outlining and following safe operating procedures for use of heavy equipment, we learn to prevent injury and safeguard ourselves and our coworkers.

II. GOALS

To ensure all employees know and understand the safe operating procedures for the safe operation and maintenance of Heavy Equipment.

III. PURPOSE

To reduce the risk of a work related injury or death by maximizing personal safety during Heavy Equipment operation.

Safe Operating Procedures for the Following Heavy Equipment:

- Backhoe
- Dozers
- Loaders
- Road Graders
- Scrapers
- Skidsteers
- Trucks

General Safety for Heavy Equipment

Only trained and authorized operators shall be permitted to operate the designated equipment.

1. Personal protective equipment is **mandatory** and may include the following:
 - boots or safety shoes
 - eye/face protection
 - long pants
 - hard hat
 - hearing protection
 - gloves

2. Pre-start/Walk around inspection:
 - Check for loose or worn parts and repair or replace immediately.
 - Check all fluid/coolant levels.

Caution: Open the radiator cap only when the engine is cooled.

- Inspect hydraulic line connectors and hoses for leaks before applying pressure to the system. Use paper or cardboard, not your hands, to search for leaks.

Caution: Hydraulic fluid escaping under pressure can penetrate skin and cause serious bodily harm.

- Check tires for cuts, bulges, irregularities, abnormal wear and proper inflation.
- A fire extinguisher and first aid kit shall be mounted in the cab.

3. Machine Maintenance:
 - When servicing equipment, fasten a **Do Not Operate** tag on the steering wheel. Review *Lock Out/Tag Out Procedures* prior to servicing any equipment.

- Ensure the cab area is clean and free of debris and tools.
- Clean windshield, mirrors and lights.
- Remove all oil, grease or mud and snow from grab irons, hand rails, steps, pedals, and floor to prevent slips and falls.
- Remove or secure any loose items such as tools, chains, or lunch boxes from the cab.

4. Work Site:

- Check and mark the area for underground cables, gas lines, and water mains.
- Know work area clearances - watch for overhead or underground objects, holes, drop-offs, and partially hidden obstacles and wires.

5. Mount properly:

DO NOT GET ON OR OFF A MACHINE THAT IS IN MOTION

- Maintain a 3-point contact with the steps and hand rails while getting on/into the machine
- **do not** use the controls or steering wheel as a handhold.
- Do not operate the machine with wet, greasy, or muddy hands or shoes.

6. Starting and Testing:

EXHAUST FUMES ARE DANGEROUS - ALWAYS HAVE A RUNNING MACHINE IN A WELL VENTILATED AREA.

- Fasten your seat belt and adjust the seat prior to starting.
- Controls should be in neutral and the parking brake set before starting engine.
- Start the engine only from the operator's seat.
- Warn personnel in the area that you are starting the engine.
- Check all gauges, light, instruments and warning devices to assure that they are functioning properly and the readings are within normal range.
- Test steering right and left.
- Test brakes against ground speed to be certain there is no malfunction.
- Ensure all implement controls are operating properly.

7. Machine Operation

SMOKING IS PROHIBITED AT ALL TIMES.

- Acquaint yourself with the controls before operating the machine.
- Only the operator is permitted to ride on the machine.
- While backing up use extra care and sound the horn to clear the area.
- If a malfunction is observed, "DO NOT OPERATE" until the proper repairs have been made.
- Drive at speeds compatible with working conditions.
- Do not coast downhill. Select a gear that will prevent excessive speed when going downhill. Do not park on a steep incline.
- Know the stopping distance at any given working speed.
- Do not permit anyone to stand or pass under the bucket or lift arms.
- Follow the manufacturer's load capacity limits. Identification plates are attached to all machines.
- If the machine is stuck, back it out or stop engine and get help.
- Do not make mechanical adjustments while the unit is in motion.
- Always follow the manufacturer's recommendations for pulling or towing.
- Lower all the hydraulic equipment before shutting down or getting off the machine.

- During snow removal, be alert for any obstructions covered by snow.
8. Ether - Cold Start Precautions
- Diesel cold start systems contain ether which is explosive. Keep away from heat, sparks, and open flames. Work in a well-ventilated area.
 - If swallowed, breathed or contacted on skin or eyes seek medical attention immediately. Follow recommendations on the MSDS sheets.
 - Point the openings of the valve, tube or atomizer away from yourself and others while testing the diesel cold start system.
 - Store replacement ether cylinders in a cool dry place away from direct sunlight. Do not keep them in the operator's compartment.
9. Operating a PTO
- Shut off the engine and wait until the PTO stops completely before getting off, disconnecting or servicing the PTO unit.
 - Wear snug fitting clothing when operating the power take-off, or when near rotating equipment.
 - When operating stationary PTO equipment, always apply the parking brake and block the rear wheels front and back to prevent any unnecessary movement.
 - PTO shields are mandatory on all PTO-driven equipment.
10. Refueling
- Shut off and cool the engine and any electrical equipment before fueling.
 - Ensure the fueling area is well ventilated.
 - Do not smoke while refueling. Keep open flames and sparks away from area.
 - Ground the funnel or fuel nozzle against the filler neck to avoid sparks when refueling.
 - Do not use gasoline or diesel fuel for cleaning parts.
 - Check the battery and electrolyte levels according to manufacturers instructions.
 - Know where the fire extinguishers are located.
11. Road Rules
- When turning, use hand or turn signals.
 - Obey all traffic regulations. Know local traffic laws regarding lights, warning signs, load limits, and slow moving equipment on highways/roadways.
 - When backing up traffic, pull over and allow the vehicles to pass.
12. Shut Down/Parking
- Park on level ground.
 - When parking on a grade, block the wheels and set the parking brakes.
 - When parking, lower all loader, buckets, hydraulics to the ground.

BACKHOES

- **KNOW THE WORKING RANGE OF THE MACHINE.**
- Be sure attachment or load doesn't catch on obstructions when lifting or swinging.
- When lifting a load, do not lift, swing or stop unnecessarily fast.
- Be sure everyone is in the clear before swinging or moving in any direction. **NEVER** swing or position attachment or load over personnel or vehicle cabs.
- Never allow personnel to walk or work under any part of the machine or load while the machine is operating.

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- Never allow anyone to ride the attachment or the load. This is an extremely dangerous practice.
 - Do not load a truck unless the driver is in a safe place. Then, load the truck from the rear or side.
 - Use a signal person. The signal person must be in direct communication with the operator, and the operator must pay close attention to the signals.
 - Never exceed the lifting capacity of the machine. Stay within the lifting limits shown on the Load Rating Chart. Remember - you may be able to lift the load in close, at ground level, but as the load radius and elevation change, the lifting capacity of the excavator may decrease.
 - Keep the machine well back from the edge of an excavation. Avoid undercutting the machine. If necessary, provide adequate shoring to prevent the machine from falling into the excavation.
 - Level off the work area if possible.
 - Avoid swinging or extending the bucket farther than necessary in a downhill direction. This will reduce the stability of the machine.
 - When working with the bucket on the uphill side, the excavator may tip over if the slope is too steep.
 - Avoid working with the tracks across the slope, as this reduces stability and increases the tendency for the machine to slide.
 - Always be sure that slings or chains used to lift the load are of adequate strength and that they are in good condition.
 - Watch your boom clearance at all times.
 - Turn off the engine and allow the machine to cool before working on the machine. Most fluids on the excavator are hot enough to cause severe burns at normal operating temperatures.

DOZERS

- Operate the controls only with the engine running.
- Do not allow riders on the machine unless additional seat, seat belt, and rollover protection are provided.
- The operator must satisfy himself that no one will be endangered before moving the machine.
- Report any needed repairs noted during operation.
- Carry implements close to the ground, approximately 40cm (15 in) above ground level.
- Stay a safe distance from the edge of cliffs, overhangs, and slide areas.
- If the machine begins to sideslip on a grade, immediately dispose of the load and turn the machine downhill.
- Be careful to avoid the condition which could lead to tipping when working on hills, banks, or slopes, and when crossing ditches, ridges, or other obstructions.
- Work up and down slopes, rather than sideways, whenever possible.
- Keep the machine under control and do not work it over its capacity.
- Be sure hitch points and the towing device are adequate.
- Connect trailing equipment to a drawbar or hitch only.
- Never straddle a cable, wire rope, or similar device nor allow others to do so.
- Personnel are prohibited to be between the machine and trailing equipment when maneuvering to connect them. Block the tongue or hitch of trailing equipment to align it with the drawbar or hitch.

LOADERS

- This is a one-person machine, **NO RIDERS ALLOWED**.
- Know the pinch points and wrap points on the loader.
- Operate at a speed consistent with working conditions, visibility, and terrain.
- Ensure loader has an adequate rear counterweight
- When crossing exposed railroad tracks, ditches, ridges, or curbs reduce speed and cross at an angle.
- Carry loaded buckets as close to the ground as possible. The further a loaded bucket is from the ground the more unstable the loader becomes.
- Use extreme caution when operating a loader on a side slope. Slow down and carry the bucket, loaded or empty, as close to the ground as possible.
- Stay in gear when traveling downhill - this will help control speed.
- Never move a load above the heads of other workers.
- When back filling, use extreme caution. The weight of the material plus the weight of the machine could cause the new construction to collapse.
- Keep work area level; avoid developing ruts by occasionally back dragging the bucket to smooth the surface.

ROAD GRADER

- Do not permit riders in or on the grader. Grader is a one-person piece of equipment.
- Do not dismount from the grader with the engine running - lower all attachments and stop engine first.
- Before backing up, use extra care to ensure persons and vehicles are clear of the grader.
- Know and use hand signals required for particular jobs and know who has the responsibility for signaling.
- Select a gear that will prevent excessive speed when going downhill. Do not coast downhill.
- Note and avoid all hazards and obstructions such as overhangs, ledges, slide areas, electrical lines, underground cables, water mains, or gas lines.
- Watch for bystanders and never allow anyone to be under or to reach into the grader and its attachments while operating.
- Check the local traffic laws for correct traveling requirements. If necessary, pull over and allow traffic to pass.
- When working near traffic areas or at night, use extra care. Use precautions, such as flares or reflectors, cones, red flags or red lights, barricades, flashing lights, and flagmen.
- Do not operate the grader in areas where volatile gases, dust, and combustibles may be present.
- Ensure the grader is properly equipped for grading in dry or forested areas.
- Avoid lubrication or mechanical adjustments with the grader in motion or the engine operating. Keep your head, body, limbs, feet, and hands away from all moving parts.
- Use extreme care when working with hydraulic systems. Relieve the hydraulic system pressure before performing any service.
- Match speed of the vehicle to job conditions.
- Be careful when operating with the wheels at right angle to a slope.
- When hooking up trailing equipment, keep all personnel away.
- Know your stopping distance at any given speed.
- Use caution when crossing side hills, ridges, ditches, and other obstructions.
- Keep close to inside bank when working on a side hill road or cut. Extend the blade to material near outer edge.
- Use extreme care to avoid tipping when working on hills, banks, or slopes.

- Cross obstacles at an angle and at slow speed. Be alert for sudden movement of machine when going over center of obstacle.
- Operate the vehicle only on level surface when cutting high banks.

SCRAPERS

- Do not try to climb on or off the machine when carrying tools or supplies. Use a hand line to pull equipment up onto the platform.
- Check for proper operation of all controls and protective devices while moving slowly in an open area.
- Operate the machine only while seated.
- Operate the controls only with the engine running.
- Do not allow riders on the machine unless additional seat, seat belt, and rollover protection are provided.
- Carry bowl close to the ground, approximately 40cm (15 in) above ground level.
- Stay a safe distance from the edge of cliffs, overhangs, and slide areas.
- If the machine begins to sideslip on a grade, lower the bowl and bring the machine to a safe stop.
- Be careful to avoid the condition which could lead to tipping when working on hills, banks, or slopes, and when crossing ditches, ridges, or other obstructions.
- Work up and down slopes, rather than sideways, whenever possible.
- Keep the machine under control and do not work it over its capacity.
- Personnel are prohibited from being between the machine and trailing equipment when maneuvering to connect them. Block the tongue or hitch of trailing equipment to align it with the drawbar or hitch.
- Park on a level surface. If necessary to park on a grade, block the machine. Lower bowl to the ground and apply slight down pressure. Stop the engine.

SKIDSTEERS

- Check to see that counterweights as recommended by the manufacturer are in place. NOTE: This is very important as improperly balanced skid-steer loaders are easily upset.
- Clean steps, pedals, and floor of any slippery substances.
- Clear the driving compartment for loose items that might interfere with the controls.
- Check the work area for hazards such as holes, soft spots, and obstructions. Check overhead for utility lines, doorway clearances, or other obstructions.
- Mount the machine wearing clean, dry shoes using the grab bars or handrails provided.
- Adjust the seat, fasten the seat belt, set the brake, and place transmission in park or neutral before cranking the engine.
- Visually check for the presence of others in the area and warn them away. Be especially alert for children.
- If the machine is garaged, leave the door or some windows open for ventilating the exhaust. CARBON MONOXIDE KILLS!
- Start the engine and check all controls to see that they are functioning properly.
- Check horn and backup alarm to see that they are working.
- Operate with caution on uneven surfaces. Avoid steep slopes completely.
- Carry the load as low as possible. Avoid sharp turns and slopes with a raised load.
- Travel straight up or down, with the heavy end of the machine pointed uphill.
- Operate with extreme caution near areas with sharp drop-offs.
- Do not undercut banks or materials that are piled high, to avoid cave-ins or falling of material.
- NEVER leave the machine without first lowering the bucket, stopping the engine, setting the

parking brake, and placing the shift in park or neutral. Dismount the machine carefully. Do not jump out of the loader.

- If stopping for any length of time, lock the ignition and remove the key.

TRUCKS

- Truck drivers will be properly and thoroughly trained before attempting to do any work with or on any type of truck.
- Our motor vehicle policy, as well as State and Federal regulations prohibit the operation of commercial motor vehicles by individuals who do not have the proper training and license. Do not attempt to operate any dump truck unless you have the proper license and training.
- Thoroughly inspect the truck for any defects that may inhibit safe operation of the vehicle. DOT regulations require that the operator fill an inspection form each day before placing the truck into operation. This form is an excellent tool to help the operator remember to check all necessary items.
- Always use the steps and grab irons and face the vehicle when getting in or out of the truck.
- Place the gearshift into neutral and set the parking brake before starting the engine.
- Allow the engine to reach operating temperature and the air pressure to build to operating pressure before placing the truck into motion.
- Carefully check the area around the truck before placing it into motion. Objects or people that are very close to the truck may not be visible from the driver's seat.
- Always make sure that your seatbelt is properly fastened before driving the truck.
- Allow adequate stopping distance between the truck and the vehicles in front of it.
- Check the area around the truck for obstructions (tree limbs, overhead wires, etc.) before raising the dump box. Make sure that the spreader chains aren't set if you intend to dump in a pile.
- Always try to be on a level surface when you raise the dump box. As the box raises the truck's center of gravity goes up and the truck becomes less stable and more apt to tip over. If you must dump on a slope place the truck so that it faces straight up, or down the slope. Do not try to raise the box with the truck parked parallel with the slope. Remember that a dump truck is much more apt to tip over (or run into overhead obstructions) when spreading material than it is when dumping in a pile.
- NEVER work under a raised box (not even "for just a little bit") unless the box is adequately supported by a prop rod or cribbing. Do not rely on the truck's hydraulic system to hold the box up while you work under it.