

[Organization logo]

[Organization name]

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STANDARD OPERATING PROCEDURE FOR OPERATING HEAVY MACHINERY

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Commented [45A2]: Adapt to the existing practice in organization.

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Change history

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1. Purpose, scope and users

The purpose of this document is to reduce the risk of a work-related injury or death by maximizing personal safety during heavy machinery operation.

This document applies to all work places and activities in the work environment of [organization name] where heavy machinery is used.

Users of this document are employees operating heavy machinery in [organization name].

2. Reference documents

- ISO 45001:2018 standard, clause 8.1
- OH&S Manual
- OH&S Policy
- OH&S Objectives
- Procedure for Addressing Risks and Opportunities and OH&S Hazards
- Procedure for Operational Control
- Procedures for Preparedness and Emergency Response
- List of Legal and Other Requirements
- Procedure for Incident Investigation

3. General safety rules for operating heavy machinery

[Job title] ensures that only trained and authorized operators are permitted to operate the designated equipment.

3.1. Personal protective equipment

Personal protective equipment is mandatory and may include the following:

- boots or safety shoes
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]

Personal protective equipment is controlled and used according to the SOP for Personal Protection Equipment.

3.2. Pre start inspection

Commented [45A4]: Adapt to organization's needs.

Commented [45A5]: Adapt to organization's needs.

[Job title] performs the following activities during pre-start/walk-around inspection:

- Check for loose or worn parts and repair or replace immediately.
- Check all fluid reservoir levels. Refill as needed. Turn the engine up only after the engine is cooled.
- Inspect the battery, the alternator, and hoses for leaks before applying pressure to the system. The engine is a combustion engine and leaks, in general, are not safe. Refill the battery fluid according to the instructions on the battery and never connect the battery.
- Check tires for cuts, bulges, irregularities, abnormal wear, and proper inflation.
- A fire extinguisher and first aid kit shall be mounted in the cabin.

3.3. Machine maintenance

Commented [45A6]: Adapt to organization's needs.

[Job title] ensures that the following rules are applied during machine maintenance:

- When servicing equipment, fasten a **Do Not Operate** tag on the steering wheel.
- Disconnect the battery to clear out the alternator and fuse.
- Turn off the engine, lights, and fans.
- Remove all oil, grease, mud, and other fluids from gauges, hoses, belts, hoses, cables, and hoses to prevent slip and fall.
- Remove or secure any loose items such as tools, chains, or lunch boxes from the cab.

3.4. Work site

[Job title] ensures that the following rules are applied at the work site:

- Check and mark the area for underground cables, gas lines, and other utilities.
- Check work area clearance – work to be completed in underground spaces, holes, deep ditches, and partially hidden obstacles and wires.

3.5. Mounting, starting and testing

Commented [45A7]: Adapt to organization's needs.

[Job title] ensures that the following rules apply when mounting machinery:

- Do not get on or off a machine that is in motion.
- Remain in contact with the step and hand rail while getting on/off the machine.
- Do not use the controls or steering wheel in a hazardous manner.
- Do not operate the machine with oil, grease, or muddy hands or shoes.

Starting and testing is performed according to the following rules:

- Exhaust fumes are dangerous – always have a running machine in well-ventilated area.
- Turn on the lights and fans before the start of the engine.
- Turn on the battery and the starting motor and before starting engine.
- Turn the engine on from the operator's seat.
- When operating in the area that you are starting the engine.
- Check all gauges, lights, instruments, and warning devices to assure that they are functioning properly and the readings are within normal range.

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- Test steering right and left.
- Test the engine, operate ground speed to the control station to see if it functions.
- Ensure all implement controls are operating properly.

3.6. Machine operation

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[Job title] ensures that the following rules apply when operating machines:

- Smoking is prohibited at all times.
- Operate controls with the correct safety operating procedure.
- Only the operator is permitted to ride on the machine.
- While backing up, use extra care and sound the horn to clear the way.
- Do not operate in adverse, or poor, conditions, and the proper signs have been made.
- Drive at speeds compatible with working conditions.
- Do not over-boost, unless a sign that will prevent excessive speed after going forward, is not used as a stop sign.
- 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. Distribution 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 setting or loading.
- Lower all the hydraulic equipment before shutting down or getting off the machine.
- During snow removal, be alert for any obstructions covered by snow.

3.7. Ether – Cold start precautions

Commented [45A9]: Adapt to organization's needs; delete if such equipment is not used by the organization.

Diesel cold start systems contain ether, which is explosive; [job title] ensures that employees apply the following rules when operating such equipment:

- Read manual from back, middle, and open flames. Work in a well-ventilated area.
- If conditions, weather, or conditions are poor, use extra caution when operating. Follow recommendations in the MSDS sheet.
- Point the openings of the valve, tube, or atomizer away from yourself and others while testing the diesel cold start system.
- Store equipment after use in a well-ventilated area from direct sunlight. Do not keep ether in the operator's compartment.

3.8. Refueling and parking

Commented [45A10]: Adapt to organization's needs.

[Job title] is responsible for ensuring that the following rules are applied during refueling and parking:

- Shut off and cool the engine and any electrical equipment before fueling.
- Follow the fueling area's work conditions.
- 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 starting.
- Read the battery and electrical loads according to manufacturer's instructions.
- Never allow the fire extinguisher to be used.
- Do not drink alcohol.
- When parking or loading, block the wheels and set the parking brake.
- When parking, lower all loaders, buckets, and hydraulics to the ground.

4. Precaution measures for operating heavy machinery

4.1. Backhoes

[Job title] ensures that backhoes are operated according to the following rules:

- Know the working range of the machine.
- Do not dismount or load down a lift or attachment when lifting or carrying.
- When lifting, load, or set up, swing, or stop, continuously test.
- Do not operate in or on the edge before carrying or moving in any direction. With swing or position attachment or load not secured or stable.
- Never allow personnel to walk or work under any part of the machine or load while the machine is operating.
- 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 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. Do not lift the lifting hook above the load lifting limit. Remember – you may be able to lift the load in air, at ground level, but in the real world, with vibration, shock, the lifting capacity of the machine 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 carrying or extending the bucket further than necessary in a desired direction. Full swing will reduce the stability of the machine.
- When working with the bucket on the left side, the excavator may tip over if the steps to the right.
- Avoid working with the bucket across the steps, as this reduces stability and increases the tendency for the machine to slip.
- Always be sure that slings or chains used to lift the load are of adequate strength and that they are in good condition.

Commented [45A11]: Adapt to organization's needs; delete if such equipment is not used by the organization.

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- Watch your boom clearance at all times.
- Turn off the engine and allow the machine to cool before working on the machine. Wait until the radiator fan has stopped to avoid severe burns at normal operating temperatures.

4.2. Dozers

[Job title] ensures that dozers are operated according to the following rules:

- Operate the controls only with the engine running.
- Do not allow others on the machine unless additional seat, seat belt, and safety protection are provided.
- The operator must always know that no one will be endangered before leaving the machine.
- Report any needed repairs before starting operation.
- Carry implements close to the ground, approximately 40 cm (15 in) above ground level.
- Stay a safe distance from the edges 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.
- Do not work on steep slopes which could lead to tipping when working on the backs of slopes, and when crossing ditches, rills, or other depressions.
- Work up and down slopes, rather than across, whenever possible.
- Keep the machine under control and do not work to over its capacity.
- Do not work on steep slopes and the loading device are adequately.
- Connect loading equipment to a dozer in 100% 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 disconnecting or connecting them. Wait for engine or both of trailing equipment to stop to shift the dozer in 100%.

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4.3. Loaders

[Job title] ensures that loaders are operated according to the following rules:

- This is a one-person machine; NO RIDERS ALLOWED.
- Know the rated capacity and load limits of the machine.
- Operate at a speed consistent with working conditions, stability, and terrain.
- Do not work on or adjacent to overhangs.
- When crossing ditches, rills, or other depressions, reduce speed and travel at 10 mph.
- 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.
- Do not work on steep slopes when operating a loader in 100% range. Stop down and work the bucket loaded in 100% or lower to the ground as possible.
- Stay in gear when traveling downhill – this will help control speed.

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- Never move a load above the heads of other workers.
- When using any, use correct posture. The weight of the material plus the weight of the machine must never be too much for the operator.
- Stop work and back away from the blade to manually back dragging the blade to smooth the surface.

4.4. Road grader

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[Job title] ensures that road graders are operated according to the following rules:

- Do not permit riders in or on the grader. The grader is a one-person piece of equipment.
- Do not dismount from the grader with the engine running. Wear all attachments and stop engine first.
- Before working on a side hill, use the blade to smooth the surface and establish the base of the grade.
- When working on a side hill, the operator is responsible for the stability of the machine.
- 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 or its attachments while operating.
- Check the road traffic rules for correct working requirements. If necessary, adjust and stop the traffic signs.
- When working on a side hill, use the blade to smooth the surface and establish the base of the grade. Use the blade to smooth the surface and establish the base of the grade.
- Do not operate the grader in areas where overhead power lines and other obstructions 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.
- Do not operate with other workers with hydraulic systems. Release the hydraulic system pressure before performing the work.
- Work at a safe distance from the blade.
- Do not operate with the blade at a height of 10 feet or higher.
- When working on a side hill, use the blade to smooth the surface and establish the base of the grade.
- When working on a side hill, use the blade to smooth the surface and establish the base of the grade.
- 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.
- Do not operate with the blade at a height of 10 feet or higher.
- When working on a side hill, use the blade to smooth the surface and establish the base of the grade.
- Operate the vehicle only on level surface when cutting high banks.

4.5. Scrapers

[Job title] ensures that scrapers are operated according to the following rules:

- 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.
- Read the operator's manual for all controls and protective devices with moving parts to all parts of the machine.
- Operate the machine only with control.
- Operate the controls only with the engine running.
- Do not allow others on the machine unless additional seats, seat belts, and other protection are provided.
- Carry bowl close to the ground, approximately 40 cm (15 in) above ground level.
- Stay a safe distance from the edges of cliffs, overhangs, and slide areas.
- If the machine begins to slide or lurch, stop the work and bring the machine to a safe stop.
- Do not allow anyone on the machine while it is sliding or lurching after working on the side of a cliff, overhang, or slide area.
- Work up and down slopes, unless they are otherwise otherwise specified.
- Stop the machine only when it is not used to work on a slope.
- 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.
- Stop in a clear area. If necessary to stop on a slope, stop the machine, lower bowl to the ground and apply high shoe pressure. Stop the engine.

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4.6. Skid steers

[Job title] ensures that skid steers are operated according to the following rules:

- Read the operator's manual for all controls and protective devices with moving parts to all parts of the machine.
 - Operate the machine only with control.
 - Operate the controls only with the engine running.
 - Do not allow others on the machine unless additional seats, seat belts, and other protection are provided.
 - Check the work area for hazards such as holes, soft spots, and obstructions. Check over head 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 gearshift in park or neutral before starting the engine.
 - Be alert for the presence of others in the area and wear them away. Be especially alert for children.
 - If the machine is stopped, stop the work or other activities and be watching the exhaust.
- CARBON MONOXIDE KILLS!**
- Start the engine and check all controls to see that they are functioning properly.

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- Check horn and back-up alarm to see that they are working.
- Operate with caution on uneven surfaces. Avoid steep slopes completely.
- Turn the load as low as possible. Avoid steep turns and stops with a loaded load.
- Travel straight up or down, with the heavy end of the machine pointed uphill.
- Operate with extreme caution near areas with steep drop-offs.
- Do not overload loads or materials that are added high. To avoid overloading or falling of material.
- NEVER leave the machine without first lowering the bucket, stopping the engine, setting the parking brake, and placing the gearshift in park or neutral. Dismount the machine carefully.
- Do not work on top of the bucket.
- If stopping for any length of time, lock the ignition and remove the key.

4.7. Trucks

[Job title] ensures that trucks are operated according to the following rules:

- Truck drivers will be properly and thoroughly trained before attempting to do any work with or on any type of truck.
- Do not operate vehicles, as well as government regulations, prohibit the operation of commercial motor vehicles by individuals who do not have the proper training and licensing. Do not attempt to operate any heavy truck unless you have the proper license and training.
- Thoroughly inspect the truck for any defects that may inhibit safe operation of the vehicle.
- Always use the steps and grab rails and lean 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 putting the truck into motion.
- Carefully check the area around the truck before getting in the vehicle. Always be aware that any area close to the truck may not be visible from the driver's seat.
- Always make sure that you are seated properly before driving the truck.
- When attaching coupling devices between the truck and the vehicle, be sure to:
- Check the area around the truck for obstructions (tree limbs, overhead wires, etc.) before using the dumping box. Make sure that the grounds under each set of wheels is being in level.
- Always try to be on a level surface when you use the dumping box. In the few cases, the truck's center of gravity goes up and the truck becomes too 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 level.
- NEVER work under a suspended load ever. The load will fall if it is not properly supported. Remember to always use the correct tie-in the truck's hydraulic system to hold the box up while you work under it.

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