

Heavy Equipment Safety Practice

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1.0 Purpose

Heavy equipment is used throughout the exploration, development, production, abandonment, reclamation and remediation phases of all Cenovus projects. *The Heavy Equipment Safety Practice* has been developed to assist employees and contractors in identifying and managing hazards associated with the use of heavy equipment, and to provide familiarity with the regulatory requirements and safe practices necessary to safely operate heavy equipment.

2.0 Scope

This *Practice* applies to all Cenovus worksites (temporary and permanent) and encompasses all Cenovus work activities in Alberta and Saskatchewan. This practice applies to all Cenovus staff and service providers.

Heavy equipment refers to powered mobile equipment used within Cenovus operations, excluding motor vehicles, that have the primary purpose of transporting personnel or goods, primarily along developed roadways.

Examples of heavy equipment include but are not limited to bucket loaders, scrapers and graders, tracked and rubber-tired bulldozers, backhoes, excavators, front-end loaders, dump trucks, packers, pavers, forklifts, concrete pumpers, pile-driving equipment, and skid steers.

While most portable cranes are considered heavy equipment by Cenovus, the information required for conducting safe crane operations on Cenovus worksites is provided under the *Cenovus Crane and Rigging Practice*.

This *Practice* does not apply to single or multi-passenger off-highway vehicles/all-terrain vehicles (OHV/ATV) or utility-terrain vehicles (UTV). See the *Cenovus OHV/ATV Practice* for health and safety requirements for these vehicles.

This practice does not include vehicle or equipment requirements under either the Alberta or Saskatchewan *Traffic Safety Act*, in respect of operating or transporting heavy equipment on public roads or highways.

3.0 Process Requirements

The following requirements are considered minimum expectations for the use of heavy equipment on Cenovus worksites. To confirm specific legislated requirements, vehicle operators should refer to the applicable safety and transportation regulations.

Cenovus employees and contractors operating any heavy equipment at Cenovus facilities or on Cenovus right of ways must:

- Hold a current and valid driver's license issued by the applicable provincial vehicle licensing authority
- Have completed a vehicle operator safety course and hold a current and valid license or certificate applicable to the equipment being operated
- Be authorized by the operator's employer (Cenovus or contractor, as applicable) to operate that specific type of equipment

- Confirm by inspection that, where required by regulation, the appropriate vehicle certificate of registration documentation, proof of vehicle insurance coverage (financial responsibility card), and an operator's manual are carried with the vehicle, and a license plate and validation tab are mounted on the vehicle where they remain clearly visible
- Verify that the number of persons being transported does not exceed the manufacturer's design specifications or the number of designated seats fitted with seat belts
- Confirm that all personnel riding heavy equipment while it is in operation use seatbelts in a properly adjusted and securely fastened manner, where seatbelts have been installed by the manufacturer – where installed by the manufacturer, seatbelts are not to be removed from heavy equipment
- Verify that all personnel riding heavy equipment wear the safety protective equipment and clothing as required by the manufacturer, or as designated by Cenovus or the contractor
- Evaluate the assigned job, select the appropriate attachment(s) to complete the work, and use the attachment(s) solely for their designed task and for no other alternative purpose
- Maintain or complete any operating logs or records for the equipment, as required by the employer

Site supervisors are responsible to strictly enforce the following prohibitions:

- No employee or contractor personnel shall operate heavy equipment when their judgement may be affected by prescription or over-the-counter medicines
- Cenovus employees shall not operate contractor owned, leased or rented heavy equipment
- No employee or contractor personnel under the age of 16 is permitted to operate heavy equipment on Cenovus worksites or in support of any Cenovus work-related activities
- At NO time are persons to be transported on fenders, mounting steps, hooks, forks, pallets or in buckets, or by any other manner on the equipment other than as designed by the manufacturer for personnel transport

3.1 General Operating Practices

All workers operating, maintaining and refuelling heavy equipment or working near operational heavy equipment must complete and document a job-specific hazard or risk assessment.

3.1.1 Transporting Heavy Equipment

Mobile heavy equipment can self-transport on or along highways if the equipment is road-worthy, that is, it is suitably equipped with the lights, signage and other safety equipment specified by motor-

vehicle/transportation regulation. Some heavy equipment may be more appropriately transported by trailer.

Primary concerns of trailer transportation are using appropriately sized fit-for-purpose manufactured vehicle ramps to get the vehicle onto and off of the trailer-bed, and the securing of the heavy equipment during transportation. Confirm that the heavy equipment is securely fastened to the trailer bed during transportation using the appropriate hold-down points on the heavy equipment and on the trailer deck, frame or chassis, as specified by the respective manufacturers.

Where Cenovus or contractor personnel use vehicle trailers to transport heavy equipment, the trailer manufacturer's recommendations regarding loading, weight-balance, securing and unloading are to be followed.

The maximum height of the load (trailer and heavy equipment) must be determined before any equipment is transported. The load must not exceed the height requirements established in transportation and safety regulation for the designated highway corridor or route segments unless proper approval and permits are received by the governing agency. Where the combined height of the vehicle and load is greater than 4.15 metres (13 ft. 6 in.), a high load permit and high load move plan is required from the provincial transport agency and utility owner, respectively. The *Cenovus Overhead Power Line Encroachment* practice must also be consulted and complied with.

Secure and brace the heavy equipment using the appropriately rated tie-down arrangements. Pay particular attention to parts of the heavy equipment that overhang the trailer. Provincial traffic regulations require high-visibility flagging (and/or lighting) for loads that overhang the sides or ends of trailers.

3.1.2 Heavy Equipment Maintenance

Where Cenovus or contracting companies operate self-owned heavy equipment, each organization is responsible to comply with the manufacturer's recommended inspection and maintenance procedures, maintaining the appropriate use and maintenance records.

There are shop-level inspections and maintenance items (e.g. engine, lubricants, suspension, transmission, and structural) and field-level maintenance items (e.g. fluids, tire/tread condition, and driving safety items (lights, horn, mirrors, seatbelts, door-latches)). Manufacturers have established inspection and maintenance procedures and these should be consulted and conducted prior to each day's use.

Where Cenovus or contracting companies operate leased or rented heavy equipment, each organization is responsible to ensure that the leasing/renting agency has been implementing the manufacturer's recommended inspection and maintenance procedures. The company representative should request to receive a copy of, or at least view, the individual maintenance record for that piece of heavy equipment when picking up the lease/rental.

On long-term leases, frequently the user organization agrees to maintain the equipment. If this is the case, then confirm that the manufacturer's recommended maintenance schedule, list of parts and lubricants, and maintenance instructions are included with the heavy equipment when first picked up from the seller, lessor, or rental agency.

All inspections must be documented and this documentation must be stored with the equipment. Additional copies can be recorded and kept on file with the leasing or operating company.

When maintaining equipment all hazardous energy shall be isolated as per OH&S code and Cenovus's or the contractor isolation procedures. A hazardous energy test or verification process is required before executing any maintenance activities.

3.1.3 Heavy Equipment Pre-use Inspection

Vehicle inspection and maintenance is a cornerstone of safely operating heavy equipment. The manufacturer has established periodic inspection requirements related to the mechanical reliability of the vehicle. Within Cenovus and Cenovus worksites, these inspections are mandatory, both at the shop level and at the field-use level.

Each time a Cenovus employee or contractor personnel is assigned a task that involves operating heavy equipment, the vehicle operator shall conduct a pre-use inspection in accordance with manufacturer requirements. Additionally, for the first use of heavy equipment each day or shift, an inspection shall be conducted that includes items applicable to the type of equipment to be used, such as:

- A general conditions inspection (obvious damages)
- Fluids (fuel, lubricants, windshield wash if fitted – all topped up, no leaks)
- Suspension
- Chains or drive shaft oiled and clean
- Visual tires/tracks condition
- Safety equipment (headlights, brakes, seatbelts, first aid kit, fire extinguisher, automatic audible warning device)
- Muffler/exhaust system clear of debris/vegetation and blockages
- Windshield (if fitted)
- Latches for hatches and doors (if fitted)
- Winch (if fitted)
- Towing hitch (ball) if fitted
- Maintenance tools package

- Vehicle emergency kit
- Applicable documentation (vehicle registration, insurance)

For mobile equipment, each time prior to driving the heavy equipment, the operator is to conduct a safety circle-check or walk-around of the heavy equipment to ensure that there are no obstructions, snags, or flammables near the muffler/exhaust, the proper attachment of any towed vehicles, proper operation of brake and signal lights, no personnel in the immediate area who are not aware of the impending start-up and movement of the heavy equipment, or any other conditions that could influence the safe operation of the vehicle or cause a hazard to personnel in the immediate area.

3.1.4 Heavy Equipment Fuelling

Where possible, refuel heavy equipment at a designated fuelling station (e.g. gas station, maintenance shop, logistics facility) or fuel truck prior to the work shift. Always turn off the ignition and allow the engine and exhaust cool prior to opening the fuel cap and fuelling the vehicle. Follow the manufacturer's instructions for safe fuelling.

Workers dispensing fuel must:

- Take precautions to prevent overflowing the tank or spilling fuel
- Not knowingly overfill the fuel system
- Not use an object that is not an integral part of the hose nozzle valve assembly to regulate the flow of fuel

When refuelling in the field is required, it should be conducted at a central point where all vehicles may be fuelled. Always have a spill clean-up kit (sorberent pads, granular absorbent, short length of sorberent boom, shovel, and collection bag) as part of the heavy equipment on-site support arrangements. Do not conduct in-field refuelling without this equipment immediately available.

Do not overfill the heavy equipment fuel tank and ensure that the fuel cap is tightly threaded onto the vehicle after fuelling. Wipe any spilled fuel off of the equipment prior to starting the engine.

3.1.5 Heavy Equipment Seasonal Issues

The heavy equipment operator is to be familiar with, and understand, the operating limitations of the equipment, particularly involving crossing uneven ground or traversing hills of excessive angles (longitudinal or transversal slopes).

Heavy equipment operators are to keep in mind the hazards of loose or unconsolidated soils and ground and the potential for erosion or undercutting when working near watercourses, trenches or excavations.

Select stopping and parking areas with care. Always try to park the equipment on gravel, pavement or hard-packed ground to reduce the risk

of soil subsidence that could result in vehicle entrapment or potential toppling of the equipment.

In summer months, operating heavy equipment can cause wildfire ignitions when dry forest conditions are present. Heavy equipment use in forested areas or areas of tall, dry, vegetative ground cover during high and extreme fire danger levels can present a fire risk.

In winter months, snow cover can obscure holes, trunks and other obstructions that could impede safe travel. Travelling along or over ice-covered bodies of water can also be hazardous when the ice thickness, depth of water and under-ice current speed cannot be determined. Avoid where possible crossing unknown bodies of water, particularly in early or late winter season. For more information, see the Government of Alberta publication *Best Practice for Building and Working on Ice Covers in Alberta*.

3.1.6 Heavy Equipment in the Workplace

By virtue of their design and intended use, most types of heavy equipment encounter issues of manoeuvrability and clear sight lines when working in a typically congested workplace. The equipment-pedestrian and the equipment-property interfaces are generally the most challenging safety issues surrounding the use of heavy equipment.

Wherever reasonably practicable, the workplace must have designated walkways that separate pedestrian traffic from areas where mobile equipment is operating.

Operating speed, inattention, unfamiliarity with equipment and obstructed-vision have all been shown as key factors in heavy equipment incidents. Cenovus requires employee and contractor personnel operating heavy equipment to employ the following safeguards:

- Do not operate heavy equipment that you are not certified to operate and/or that you have not been properly trained or authorized to operate
- Operate the heavy equipment at speeds, and in a manner, appropriate to the potential hazards of the workplace (e.g. personnel, obstructions)
- Use a guide or spotter where equipment design or operating restrictions present blind spots
- Use a guide or spotter whenever heavy equipment is moving through a congested work area
- Be aware of the position of any person near the heavy equipment
- Alert personnel to the presence and movement of the heavy equipment, including the operators of other heavy equipment or vehicles in the immediate vicinity

- Do not move heavy equipment into place in support of any excavation, trench or confined space when personnel are still inhabiting those workplaces
- Exit areas where heavy equipment is moving, and re-enter these areas after the heavy equipment is positioned and stabilized against further movement
- Do not permit a worker to remain within range of the moving load/part if a movement of the load/part creates a danger to workers
- Do not move a load or equipment if a worker is exposed to danger

A number of safety precautions and procedures can be applied to most powered, mobile, heavy equipment. Some important points are:

- When mobilizing equipment to a worksite the equipment shall be clean and verified in working order
- Heavy equipment operators must conduct a pre-shift walk-around of the equipment, including inspecting the condition of the roll-over protective structure (ROPS)
- Maintain three-point contact when entering/mounting and exiting/dismounting the equipment and do not jump down
- Use hearing, head and eye protection when exposed to hazards, especially when any windows or hatches are open on the cab
- Whenever heavy equipment is moving or operating in the immediate vicinity of overhead or underground utilities or transmission systems, the hazards must be pre-identified, marked where not readily visible to the heavy equipment operator, and a guide or spotter assigned to alert the equipment operator should the equipment get too close to those hazards
- Know the working range of the equipment and lift loads only within the safe lifting/working limit of the equipment (see *Cenovus Cranes and Lifting Practice*)
- Properly secure all loads as per regulations
- If equipment must be left unattended, the operator must ensure the equipment is secured against unintended movement, and elevated parts of the equipment, and the load are landed and/or secured in a safe position
- Ensure safety/first aid kits and fire extinguishers are available, secured and up-to-date for inspection and/or certification
- Audible warning devices (e.g. back-up alarm or beeper) must be installed and operable when reversing

3.2 Worksite and Equipment Specific Maintenance and Operating Procedures

Worksite and equipment specific maintenance and operating procedures must be developed as per the manufactures’ specifications and instructions. Procedures must be followed and enforced by the worksite and work team. Procedures must align with the requirements established by this practice and by safety and transportation regulations.

All procedures must be developed and approved by competent personnel familiar and qualified in the maintenance and operations of the specific type of equipment and work activity.

4.0 Roles and Responsibilities

The following responsibilities apply to this practice:

Table 1: Roles and Responsibilities

Role	Description
Business Leaders and Frontline Supervisors	<ul style="list-style-type: none"> • Communicate and implement this practice at their operations or functional areas of authority • Demonstrate ownership and leadership by actively setting a positive example • Allocate and make available the necessary financial and human resources that are required to functionally implement this document • Confirm all workers are aware of their roles and responsibilities outlined in the process requirements section of this document • Confirm workers are trained, knowledgeable, experienced and competent on this subject • Coach and correct workers who do not understand or comply with the requirements of this document • Provide feedback to the document owner or representative concerning proposed changes or improvements to this document
Operations Health & Safety Field Teams	<ul style="list-style-type: none"> • Conduct worksite observations and assessments on a regular basis to verify compliance with the expectations described in this document • Assist with the implementation and communication of the documented requirements • Provide feedback to the document owner or representative concerning proposed changes or improvements to this document
Central Health & Safety Services	<ul style="list-style-type: none"> • Monitor and collect feedback related to this document to verify program effectiveness • Lead document reviews and revisions as per the expectations described in this document • Provide subject matter expertise when requested by Business Leaders or other functional teams

Role	Description
Assurance Teams (COMS Assurance and EHSR Compliance Audit)	<ul style="list-style-type: none"> • Lead, organize and conduct audits to verify compliance, identify gaps and suggest improvement opportunities
Business Support Teams	<ul style="list-style-type: none"> • Provide subject matter expertise when requested by Business Leaders or other functional teams
Workers	<ul style="list-style-type: none"> • Align work ethics and behaviours with the requirements of this document • Participate in required training • Recognize and report any hazards, incidents or unusual conditions that may occur during the work, and stop the work if necessary • Provide feedback to the supervisor or field H&S advisor concerning proposed changes or improvements to this document

5.0 Training and Competency

Competency describes the knowledge and skills required to successfully perform the technical aspects of a job. A worker must be able to demonstrate competency in safely performing work tasks or using equipment.

5.1 Training

All operators must be knowledgeable, trained, qualified and authorized to operate a specific model or type of heavy equipment.

Business leaders and frontline supervisors must determine if a worker is competent to safely heavy equipment.

6.0 Quality Assurance

6.1 Performance Measurement

Compliance with this practice and program effectiveness shall be assessed through program assessments and internal audits, or other measurement criteria as specified in the COMS Assurance Standard.

Business functions or departments impacted by this practice must include compliance and program effectiveness verifications in their business assurance program. Performance will be monitored and reported within the responsible departments at least every three years.

6.2 Management of Change

The document owner will complete and document reviews of this practice as follows:

- at minimum once every three years
- if there is a significant regulation or industry best practice change that indicates the need for review

- if an incident investigation indicates the causes were related to unclear or inadequate written instructions described within this document

If frequent and multiple variances are required due to operational needs, the reason(s) will be investigated and the document owner will determine if there is a business need to update this document.

If submitted MOC requests indicate gaps or significant improvement opportunities, the document owner will determine if there is a business need to update this document.

Proposed changes to this practice can be directed to H&S Programs and Projects.

7.0 Glossary

Definitions and acronyms for safety documents are described in CEN-EHS243, Definitions and Acronyms. The following acronyms are specific to this document.

Table 2: Acronyms and Abbreviations

Term	In Full
ROPS	Roll-over protective structure

8.0 References

8.1 External Documents

The following external documents support this practice:

Table 3: External Document References

Document Type	Document Title
Regulatory	Alberta OH&S Code (Part 19)
Regulatory	Saskatchewan OH&S Regulations (Part XI)

8.2 Internal Documents

The following Cenovus documents support this practice:

Table 4: Internal Document References

Document Type or Number	Document Title
Policy	Corporate Responsibility Policy
Framework	Cenovus Operations Management System (COMS) Framework
CEN-EHS243	H&S Definitions and Acronyms Standard
CEN-EHSReg787	Regulatory Definitions and Acronyms
TBD	Cenovus Cranes and Lifting Practices
CEN-EHS8214	Cenovus Off-Highway and All-Terrain Vehicle Safety Practice

Appendix A: Equipment-Specific Operating Requirements

Acknowledging that it is the responsibility of the equipment operator to be knowledgeable, trained, skilled-in and certificated for the use of the specific heavy equipment the operator is assigned to use, Cenovus has assembled the following operating practice guidance for generally similar types or uses of heavy equipment.

A.1 Forestry/Overburden-Clearance Equipment

Forestry and overburden-clearance equipment encompasses a wide range of capabilities, each type of equipment having its own particular requirements for hazard management. The general safe operating principles for a number of types of this heavy equipment are similar.

A.1.1 Feller Bunchers, Harvesters, De-limbers

Feller bunchers can be wheeled or tracked machines. Used to cut the tree trunks from their root systems for processing/removal, the feller buncher is a highly mobile piece of heavy equipment that creates a lot of local noise distractions.

De-limbers are equipment used to cut off tree limbs/branches from the tree trunk. They may be on either stationary mounts or mobile mounts.

For both of these types of heavy equipment:

- Identify and follow the safety signs positioned on the equipment
- Ensure that personnel remain at least 91 metres (300 feet) from the equipment when the saw head is operating
- Conduct a pre- and post-shift walk around inspection of the equipment, looking for obvious damage or leaks
- Mount and dismount the equipment only at locations that have steps or handholds while maintaining a three-point contact (do not use controls as handholds)
- Only operate the equipment while seated
- Do not mount or dismount a machine while it is moving
- Do not approach the cutter blades until they have completely stopped
- Do not make any adjustments while the machine is moving or the engine running
- Know the width of the equipment in order to maintain proper clearance from obstructions (e.g. fences, boundary obstacles)
- Keep the equipment decks and walkways free from foreign material and debris
- Before leaving the seat, ensure that the boom is on the ground and the brake engaged

- For tracked machines—prior to making any adjustments to the tracks, allow the track pins, bushings and joints to cool
- For wheeled machines—do not approach a warm tire as hot or warm tires have been known to catastrophically fail, resulting in an explosion

A.1.2 Mechanized Grubbers and Mulchers

Grubbers are equipment attachments for mobile equipment used to remove small trees, stumps, and brush from their holding soil. Mulchers are equipment used to chop and shred trees, brush and other plant materials, and eject cuttings as a directed spray, used for many purposes. Some mulchers are fed by using pre-baled materials.

Many of the safety items noted for the previous group of mobile forestry machinery are applicable to grubbers and mulchers. Some specific safety issues include:

- Vehicle operators are not to operate either types of equipment without having completed a familiarization or training on the equipment, including at least the manufacturers' safety requirements
- Be aware of mulcher blowers, which can kick up dust and dangerously propel smaller objects
- Ensure that the mulcher discharge is directed away from other persons
- Avoid grubber shears and mulcher equipment jams by not forcing material into the cutters
- Where a mulcher uses baled materials, the person feeding the bales (if not the equipment operator) must take care not to get their hands entangled in the bale twine and to maintain immediate communications with the machine operator
- Where a mulcher uses beater or flailing chains, inspect them daily for wear
- Should a jam occur that the machine is unable to self-clear, power down the engine, stop the machinery, return the feed system control cable to the closed position and manually or mechanically clear the materials jam

A.1.3 Wheel/Track Skidders

Skidders are wheeled or tracked heavy equipment that are used to drag (skid) felled and de-limbed logs to a central area for processing. Many of the safety items noted for the previous group of mobile forestry machinery are applicable for skidders. Some specific safety issues include:

- A skidder is typically articulated for effective operation in the woods – beware this articulation area as it is a crushing point
- Ensure that the winch wire is in good condition, not kinked or frayed (threads may be worn, but no strands should be parted)

- The operator must be aware of the primary and alternative exits and of their operation
- Be aware of combustible debris (e.g. dried vegetation) laying on hot areas of the equipment and clean it away frequently to avoid inadvertently igniting a fire
- Ensure the proper arrangement of the cable or grapple skid connections used to secure the logs for transport
- Ensure no person is in the immediate vicinity when starting to skid the logs, as improperly affixed skid connections may part
- When skidding logs, use the prepared skid lanes to transport the logs to the processing area
- Avoid using this equipment cross-slope

A.2 Site General Construction Heavy Equipment

This grouping contains most of the traditionally considered heavy equipment machines. The operation of the mobile equipment requires the implementation of many common safety practices to ensure the safety of the equipment operator and nearby personnel.

Cenovus requires that employees and contractor personnel operating these pieces of heavy equipment comply with these requirements, regulatory requirements (where they exist), and the manufacturers' safety requirements.

A number of generic safety precautions and procedures can be applied to most powered, mobile heavy equipment. Some important points are:

- Be licensed and/or certificated to operate the equipment, after having successfully completed an approved training program
- Conduct a pre-shift walk-around of the equipment
- Do not operate equipment with leaks or obvious damage that may impair the safe operation of the machine
- Inspect the roll-over protective structure (ROPS) as part of the walk-around and ensure that no welding or other permanent attachments have been added to the ROPS
- Ensure that all safety guards and/or covers are in place before operation
- Always wear the manufacturer-installed seatbelts (this applies to the equipment operator as well as passengers), especially inside a ROPS
- Know the width of the machine in order to maintain proper clearances from surrounding obstacles and obstructions
- In the event of radio failure (or if radios are not available) know the proper hand signals, which designated spotters or guides will use

- Accept signals only from one designated person
- Properly enter and exit the machines using the steps/ladders without jumping down the last few treads/rungs
- Recognize workplace hazards
- Whenever heavy equipment is moving or operating in the immediate vicinity of overhead or underground utilities or transmission systems, the hazards must be pre-identified, marked where not readily visible to the heavy equipment operator, and a guide or spotter must be assigned to alert the equipment operator should the equipment get too close to these hazards
- Be familiar with the blind spots for each piece of equipment
- Know the working range of the equipment and only work with loads within the safe lifting and slope working limits of the equipment
- Properly secure all loads
- Wear the proper protective clothing and equipment

A.1.4 Backhoe/Excavator

- Before use, review the machine's service/maintenance log to ensure that the necessary maintenance has been conducted at the appropriate intervals. (If the operator is the maintainer, this precaution may be skipped).
- Be aware of, and be ready to operate, the primary and any secondary/alternate exits for the machine.
- Do not operate the equipment from any position other than being properly seated with the seat belt fastened.
- When conducting any maintenance on a raised loader lift arm:
 - empty the bucket
 - raise the bucket to set the loader lift arm brace
 - support the bucket from below with the installed brace or another suitable bracing arrangement
- Do not adjust the manufacturer's bucket-stop settings.
- Lower the machine's stabilizers before operating the backhoe. Do not reposition the stabilizers while seated in the cab. Stand outside of the machine in order to re-position the flip-over stabilizer pads.
- Completely raise the stabilizer pads before attempting to move the machine.

- Avoid operating the machine cross-slope. Where possible operate the equipment facing either upslope or downslope.
- Various attachments may be used with this equipment, each with a specific purpose. Do not use them for alternate purposes. For example, the lifting lug on a bucket scoop is for moving the bucket around with another appropriate lifting device and **NOT** for lifting loads.
- Park on a level surface. If parking on a slope cannot be avoided, chock the wheels. Use the parking brake in all cases.
- Do not operate the vehicle using excessive speed. The suspension is engineered to absorb heavy loads and when driving the machine at high speeds, regardless of terrain, the forces of inertia tend to make the machine less stable.
- Do not approach hot or apparently damaged tires. A tire explosion is violent.
- If the equipment is operated without a cab or with the doors/windows open, the operator must wear appropriate hearing protection.
- Do not permit anyone to stand near a trench while it is being excavated.
- Do not load a truck unless the truck driver is observed to be in a safe place.

A.1.5 Skid Steers

Skid steers are wheeled or tracked highly mobile heavy equipment that are available in a number of equipment sizes and can mount a number of different attachments to conduct a broad range of functions. They can be used in forestry applications and are frequently used in general construction.

Skid steer safety involves many of the safety practices previously discussed for general mobile heavy equipment. Some additional safety practices will be required dependent upon the attachments used and the specific purposes for which the equipment will be operated. The following safe operating practices must be followed:

- Secure the cab screens in the closed position. Do not let them swing free while the equipment is being operated.
- The operator is to use the safety belt and bar to maintain proper position within the cab. This equipment is a one-person vehicle. No one is to ride on the outside or on an attachment.
- Use the steps and handholds provided by the manufacturer to mount and dismount from the machine. If they are damaged, they must be repaired.

- Only enter and exit the equipment with the engine off, lift arms down and attachments resting on the ground.
- Operators are NOT to extend head or arms outside of the cab while the equipment is being operated. The lifting arm clearances to the side of the cab are very tight and have caused crushing and amputation injuries and fatalities.
- Do not lift the loads so high or roll the attachments back so far that the load can fall onto the cab.
- If maintenance work must be conducted on the equipment with the attachment raised, manually block the lifting arms or attachment in the raised position.
- When a skid steer is overloaded or when operated too abruptly with a load in place, the equipment can become unstable and tip or roll over. Carry loads as close to the ground as possible (while still avoiding obstructions) to lower the centre-of-gravity and reduce the opportunity for roll over.
- When operating on a slope, keep the heavy end of the skid steer pointing uphill (with the bucket empty, the rear is heavier, with the bucket full, the front is heavier).
- When loading a skid steer into a trailer, back the loader up the ramp (keeping the heavy part uphill).
- Having a relatively low ground clearance, hot areas of the equipment (e.g. exhaust, engine manifold) should be cleared of combustible materials on a frequent basis in order to avoid fires.

A.1.6 Motorized or Towed Scrapers

This earthworks heavy equipment type is used to prepare terrain for future facilities, by levelling or conditioning terrain contours. The heavy equipment general safety practices previously discussed apply to this type of equipment. However, there are a few equipment-specific additional practices that should be followed:

- The scraper (whether motorized or towed) is composed of two sections, the tractor and the rear scraper. Be aware of the safety requirements of each.
- Be appropriately licensed and/or certificated to operate this equipment, after completing an approved training program in its operation.
- The tractor section safety requirements include mounting and dismounting using the steps and handholds provided by the manufacturer. Enter and exit the cab with the tractor in neutral, with the parking brake engaged, and the engine switched off. Do not jump down from the tractor (or the scraper).

- Use a ground guide or spotter when operating in congested areas.
- Always ensure personnel are clear of the immediate area when lowering or raising the scraper bowl.
- Exercise caution when turning up hill with a loaded bowl. Slow down and ease into the turn. Too abrupt a turn will expose the scraper to the danger of roll-over and injury to personnel.
- Ensure that the specific hand signals important to the safe operation of this equipment are known and understood by the operator and ground guide or spotter.
- Ensure that towed scrapers are positively connected and locked onto the towing connection.

A.1.7 Motor (Road) Graders

Many of the precautions previously noted for other powered mobile equipment apply to motor graders. Some of the more important requirements are:

- Be appropriately trained and familiar with this type of equipment prior to operating it, particularly in regards to the pre-operation settings of the steering frame lock link and the wheel lean locking bolt
- Know the width of the equipment so as to keep sufficient clearance from obstacles and obstructions (e.g. fences, boundaries, property, vehicles)
- As hot or damaged tires can be the source of a violent explosion, do not approach the vehicle in line with hot or damaged tires
- Avoid working across a slope

A.1.8 Bulldozers (Tracked and Wheeled)

Many of the precautions previously noted for other powered mobile equipment apply to bulldozers. Some of the more important requirements are:

- This equipment has the same reactions to operating on slopes as do other heavy equipment. Work up and down on slopes and try to avoid working cross-slope.
- When moving the equipment, keep the blade or other attachment at least 40 cm (15 in.) above the ground to maintain an adequate clearance, but not so high as to obstruct the operator's vision.
- Exercise caution when bulldozing knock down (or blow down) areas where trees have been felled, but not cleared. There is a risk of spear or spring-pole hazards.

A.1.9 Front-end Loaders/Bucket Loaders

Many of the precautions previously noted for other powered mobile equipment apply to loaders. Task-specific attachments for this versatile piece of heavy equipment may each have their own safety rules. Some of the more important general safety issues are:

- Ensure no passengers are carried or transported unless the loader has been fitted with an additional seat, seatbelt and a ROPS by the manufacturer
- When moving the machine, keep the bucket as close to the ground as possible
- The loader's high centre of gravity make it a dangerous machine to work cross-slope, particularly with a loaded bucket
- Do not lift or move a bucket (empty or loaded) over the heads of workers
- Ensure the loader is equipped with a rear counterweight adequate for the intended loads
- Front-end (bucket) loader vehicles can also be equipped with forestry-specific attachments, such as log/lumber forks and the saw log grapple

A.1.10 Soil Packers (Vibratory and Pneumatic Soil Compactors)

Many of the precautions previously noted for other powered mobile equipment apply to soil packers. These machines use their weight and specially designed tires, drum-rollers, treads or steel wheels to compress unconsolidated soil as they roll over it. Some of the more important general safety issues for the equipment operator are to:

- Conduct a pre-shift walk-around of the equipment. Do not operate equipment with leaks or obvious damage that may impair the safe operation of the machine.
- Mount and dismount using the steps and handholds provided by the manufacturer. Enter and exit the cab with the tractor in neutral, the parking brake engaged, and the engine switched off. Do not jump down from the ladder.
- Be familiar with the blind spots for this piece of equipment and use a ground guide or spotter when operating in congested areas.
- Do not approach hot or apparently damaged tires. A tire explosion can be hazardous.

A.1.11 Side Boom (Pipeline) Hydraulic or Mechanical Cranes

Side boom equipment may be mounted on a wheeled or tracked chassis. This equipment may also be covered within the lifting and rigging practice under separate cover. Side boom operators must pay close attention to maintaining an appropriate distance from the excavation into which they

are placing their loads. Depending upon soil type and compaction, the trench sidewall can collapse and the side boom may slide into the excavation. Many of the precautions previously noted for other powered mobile equipment apply to side booms. Some of the more important general safety issues for the equipment operator are to:

- Conduct a pre-shift walk-around of the equipment. Do not operate equipment with leaks or obvious damage that may impair the safe operation of the machine.
- Mount and dismount using the steps and handholds provided by the manufacturer. Enter and exit the cab with the tractor in neutral, the parking brake engaged, and the engine switched off. Do not jump down from the ladder.
- Ensure that there are no personnel between the side boom and the excavation while raising or lowering the boom to make a lift. Do not pass a load over any personnel.
- Ensure all unnecessary personnel are outside of the working area.
- Verify the load capacity of the side boom against the weight of the lifts. Always use the boom load rating capacity chart to establish maximum lift angles.
- Be familiar with the blind spots for that piece of equipment and use a ground guide or spotter when operating in congested areas or near overhead utilities.
- Ensure mud mats are used on soft ground, wetlands, and other unconsolidated soil types.