



HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM

Section: Heavy Equipment, Vehicles, P.M.

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 47

HEAVY EQUIPMENT, VEHICLES, PREVENTATIVE MAINTENANCE

PURPOSE

CF requires that all tools, equipment, and vehicles are maintained as per the manufacturer requirements. This will ensure proper procedures and standards are used when maintaining equipment in our workplaces.

Operators are to complete a safety circle check and report any equipment problems immediately to their supervisor. The supervisor shall make sure that such problems are attended to immediately by authorized mechanical personnel.

The heavy equipment information contained in this section is to be used as a working guideline. Always refer to the operator's manual for specific information and maintenance schedules.

General heavy equipment operators must be competent, trained or knowledgeable in the specific equipment they operate either by unions, trade qualifications, 3rd party agencies or experience.

Personal Protective Equipment & General Safety Awareness

- Heavy equipment operators must wear hard hats when the equipment they are operating is not equipped with an enclosed cab.
- Hard hats are required any time operators get out of the cab. See Section on Personal Protective Equipment.
- Seat belts are to be worn as per manufacturer specifications.
- Always take time to make sure off footing.
- Develop the 3-point contact habit (one hand and two feet or two hands and one foot).
- Don't jump off the machine. Don't get off the machine while it is in motion.
- Take care when dismounting equipment.
- Be aware of your work area and the people in it.
- Do not leave equipment running unattended.
- Report all incident/accidents and safety opportunities to a supervisor.

Pre-Checks & Start-Ups

- Before starting equipment, complete the Equipment Operators Daily Inspection, conduct a visual inspection and check oil levels, tires, lights



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and backup horn. Add oil if required.

- Disengage all drive mechanisms and clutches.
- Start equipment. Warm up for approximately 30 minutes incold weather, 15 minutes in warm weather.
- Ensure buckets are lowered and brakes are applied.

Equipment General Operating Procedures

- Always operate equipment within the rated capacity and according to manufacturer instructions, as found in the operator's manual
- Ensure that the trailer deck and ramp are clear of snow and ice when loading or unloading equipment.
- Before mounting equipment, perform a walk-around and inspection. Report any safety defects and repair requirements to a supervisor.
- Always face equipment when mounting and dismounting. Make sure both hands are free to assist in climbing onto the equipment.
- Read and obey operator warning decals placed on equipment.
- Make sure footwear is free from grease and dirt when climbing on and off machines.
- Use operator's manual start up and shut down procedures.
- Use a signal person at all times when view is obstructed.
- Operators shall be off the machine during servicing and repair procedures.
- Operate equipment with lights on at all times.
- When leaving machines, ensure you engage all safety brakes and lower all raised components.
- Do not allow anyone to ride on equipment that is not equipped to carry passengers.
- Use stabilizers when digging with rubber tired backhoe.
- Do not overbalance machine when lifting or digging.
- Do not use bucket as a "jack-hammer" – use the ripper.
- Ensure work area is clear of persons and equipment.
- Operate hydraulic controls smoothly.
- Do not ride in the back of pickup trucks.
- Obey speed limits and posted signs.
- When passing other vehicles, use extreme caution.
- For greater visibility, whenever possible, choose to make left hand turns rather than right hand turns.
- Always be aware of and maintain defensive driving techniques.
- Do not use cell phones or other personal electronics while operating any equipment



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- No smoking in any equipment
- Where there is a hazard of overhead hazards and falling material, equipment will be equipped with a Falling Object Protective Structure (FOPS), designed and installed as per manufacturer's requirements.
- Where there is a hazard of equipment overturn, equipment will be equipped with a Roll Over Protective Structure (ROPS), designed and installed as per manufacturer's requirements.

Road Right of Way

1. Obtain necessary excavation permit from the jurisdictional authority.
2. Examine the nature of the traffic at the work site to fully understand the consequences or proposed interruption.
3. Review time restrictions for closing or diverting traffic.
4. Place barricades and other warning signs as appropriate.
5. Assign traffic control persons to their duties (see Traffic control person section, below)
6. Bring in equipment and man power as necessary.

Traffic Control Person

1. Use personal protective equipment – (hard hat, high visibility safety vest, safety footwear).
2. Check sign to ensure it can be seen clearly (colour and writing).
3. If using hand radio, check to ensure it is working.
4. Position yourself where you can be seen by project and road traffic.
5. Make sure you communicate with other traffic control persons on traffic movement.
6. Direct traffic.
7. Do not use personal electronics while directing traffic.



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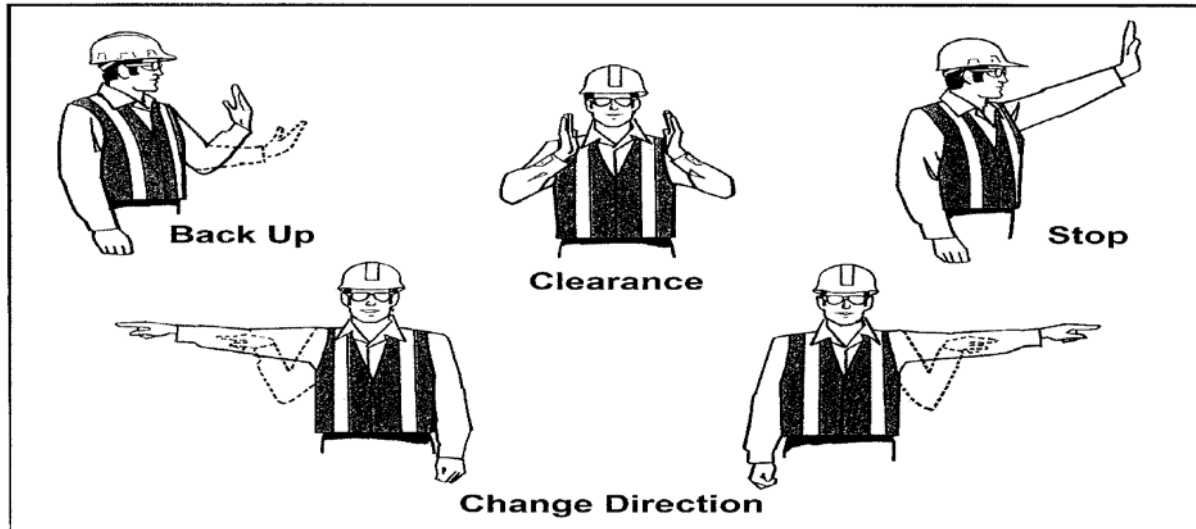
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Hand Signals for On-Site TRAFFIC CONTROL



Road Construction Work

- Traffic Control: Barricades, blinkers, flares and warning signs, etc. shall be erected as required by legislative requirements. (Refer to specific highway traffic control requirements in your geographical area.)
- Park personal vehicles in a safe location away from the project and other traffic.
- Traffic control person's vehicle must be parked clear of roadways.
- Competent, trained traffic control persons shall be used for traffic control (as required)
- Cleated equipment shall not be driven across hard surface highways or bridges without protecting the surface.
- Warning signs shall not be removed until road and highway crossings are properly leveled, shoulders repaired and ditches cleared.
- Equipment operators shall obey all directives from traffic control personnel.

Working Near Overhead Power Lines –Guidelines

- If working near or crossing under power lines:
- Use a signal person to assist if view is obstructed or you are encroaching on the limits of approach.
- Keep booms and equipment a safe distance away from overhead power lines. Refer to jurisdictional requirements in your area of operation.



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- If a closer approach is required, contact the utility CFfor assistance. The line may have to be de-energized or insulated.
- When digging near power poles, if the soil is hard, you may dig up to 5m away from the pole. In gravel or soft soil, the operator is to use his discretion. If cave- ins are being experienced, even up to 5m away from the pole, contact thepower company and it will come out to secure the pole during the digging operation.
- Erect clearly visible warning signs advising of overhead powerlines.

Procedure for Working Around Energized Overhead Electrical Conductors

All precautions reasonable in the circumstances must be taken whenworking around Energized Overhead Electrical Conductors.

The following procedure will be followed:

1. No backhoe, power shovel, side boom, loader/excavator, vehicle, crane and similar devices shall be brought closer to phase to phase voltage rating as noted below:

- 750 to 150,00 volts = minimum distance 3 meters (10 feet)
- 150,000 to250,000 volts = minimum distance 4.5 meters (15 feet)
- More than 250,000 volts = 6 meters (20 feet)

Distance may vary based on your jurisdiction.

2. If it is possible to bring part of any vehicle, equipment or its load near the minimum distance as noted above the following procedure will be followed:

A signaler will be stationed in full view of the operator, the electrical conductor and the vehicle and its load to warn the operator each time the load may approach the minimum distance.

- The signaler shall wear a fluorescentgarment.
- The signaler shall be clear at all times of the travel path of thevehicle.

3. A clear and visible warning sign indicating overhead conductors will be posted.



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NOTE: AT NO TIME WILL ANY EQUIPMENT OR LOAD BE BROUGHT WITHIN THE ABOVE NOTED MINIMUM DISTANCE. IF A CLOSER APPROACH IS REQUIRED CONSULT THE LOCAL UTILITY.



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Working Near Live Pipelines, Buried Cable and other Utilities

- Don't start work until all underground lines in the work area have been located and marked.
- Use a signal person at all times when digging in and around buried utilities.
- Never enter into an excavation or trench until it is safe to do so. See Safe Work Procedures, Section 23.
- Any excavation or trench left unattended must be barricaded to prevent entry by other workers and the public.

25.2 Safe Work Practice for Loading and Unloading Heavy Equipment

- Ensure the truck and trailer is compatible with the equipment being loaded.
- Ensure the loading / unloading area is free of overhead wires, fire hydrants, poles
- Ensure truck and trailers are parked on level ground.
- Apply parking brakes on truck and trailers.
- Ensure that the loading ramp or blocks are safe to use.
- Ensure that the machine is lined up precisely with the deck.
- Ensure that the operator can see the signal person clearly at all times.
- Ensure that the deck is free of ice and snow to ensure traction. Use salt, sand or shovel clean.
- Ensure the trailer hitch at the front is not sustaining the weight of the equipment while it's being loaded. Place approved blocking under the trailer deck prior to loading.
- Only competent personnel may load or unload heavy equipment
- Proceed to have the operator walk or drive the machine onto the deck under the direction of the signal person.
- Ensure the signal person is well clear of the machine
- When the machine has been walked onto the deck, apply parking brakes.
- Ensure all attachments are lowered and resting on the deck.
- Ensure that engine is turned off as per procedure for stopping hot engines.
- Ensure that proper chains and binders are used to secure the machine cover to the deck.
- Ensure the flags or lights are attached to machine if required.
- Ensure there is no loose material or parts left unsecured on machine.
- When unloading machines, reverse procedures.



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25.3 Tie Down Chain and Lever Binders

Standard

Workers involved with securing equipment on floats for transportation shall be familiar with the necessary tools and safety precautions:

The following safe work practice is to be used whenever load lever binders are required.

Note: Load Lever Binders with stored energy are not to be used. Many workers in the industry have been injured. Use ratchet lever binders or soft release lever binders. Do not use cheater pipes.

- Ensure the load is positioned in centre of float
- Ensure tie down chain is in good repair
- Block any equipment capable of rolling during transporting
- Ensure the necessary amount of tie downs are used to secure equipment. Check with your local jurisdiction.
- Ensure equipment is secured in place and all excess chain has been wrapped to prevent dragging. Lever handles must be secured to prevent slippage or tension.
- Drive a short distance and re-inspect load for slack. Any slack noticed will require further tension.

Note: Tie down chain shall not be used for hoisting under any circumstances. Only approved hoisting chain with load capacity tag shall be used.

25.4 Heavy Equipment – Moving & Backing Up

Operations involving heavy equipment should be planned to avoid backing the equipment as much as possible. In many operations, the awkward backing movement of this equipment is not always economically or environmentally possible.

Whenever the backward movement cannot be eliminated, the machine or equipment must be adapted for backing movements.

- Heavy construction equipment (wheeled vehicles) such as dump trucks, front-end loaders, and cement trucks are equipped with special mirrors to help eliminate blind spots. Even with these seeing aids, there are still blind spots from the operator's control position.
- Blind spot diagrams for each type of construction equipment are available from the manufacturers showing what an operator can see toward the rear of the equipment he is operating. However, some heavy construction equipment has no view to the rear from the operator's position and requires a signal person for moving backwards.



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- Reverse alarms installed on construction equipment: the advantage of the reverse alarm is that any person close to the rear of this equipment is alerted to forthcoming rearward movement of the machine
- Avoid parking vehicles or placing material or equipment in areas where heavy construction equipment is operating.
- Do a circle check for obstacles before moving equipment.
- Operators of heavy equipment must be capable of operating equipment and be physically fit.
- Operators must know the limitations of the equipment.
- Only qualified operators shall move equipment.
- If moving equipment after dark, make sure the white lights on the rear of the machine are off, if so equipped. This will prevent the public traffic from thinking that the equipment is on-coming. Hazard lights should be on if so equipped.
- When required, follow the Safe Work Guidelines for operating on steep slopes and banks.
- If moving on steep grades, maintain a minimum of 500 meters spacing between each piece of equipment. If a steep grade is less than 500 meters in length, each piece of equipment should clear the bottom of the hill (with room to spare) before the next piece of equipment begins its descent down the hill. Closer spacing and/or passing may be permitted on level road surfaces – if traffic allows.
- When moving in a train on narrow roadways, maintain spaces between each piece of equipment, so that public vehicles may pull in after passing a piece of equipment.
- Never move equipment that is low on fuel, especially on hilly roads.

25.5 Heavy Equipment Lifting Jacks & Support Stands Standard

Any operation required to raise or support any type of heavy equipment for repairs or maintenance shall be done according to manufacture specifications or best practice.

Procedure

- All lifting jacks and support stands shall have its rated capacity legibly casted or stamped on it in a place where it can be readily seen.
- All shop built stands must be certified by a registered professional engineer and safe working load visibly displayed.
- Jacks and support stands should only be used on solid level ground.

Always verify that the stand is suitable means of support capable of holding the intended load.



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25.6 Working on Uphill / Downhill Grades

- Do a walk-around check before daily start-up.
- Check all fluid levels; top them up if necessary. Why? Because with low fuel the machine might stall, low brake fluid etc.
- Check functioning of all systems (i.e. brakes, hydraulics, lights etc.). Consider reducing ballast if necessary.
- Know where ground personnel are at all times and where traffic is in relation to work.
- Wear appropriate P.P.E.
- Wear seat belts
- Before encountering a steep grade while still on level ground and stopped, shift to an appropriate gear. If unsure, consult the Foreman/Superintendent. This information must be covered in training scenarios.
- Do not shift gears for any reason while operating on grades (up or down).
- Never leave the operator's seat while operating on grades. Except in an emergency.
- Check brakes, air pressure and gauges periodically (more often than you normally would) to ensure proper operation.
- Park on a flat area or cross slope if required. Set park brakes and block wheels if necessary.

25.7 Spotters, General Requirements Standard

Applies to all equipment operating in close proximity to other vehicles, equipment, structures, material, or in congested areas where a spotter is needed to ensure safety of personal and prevention of damage.

Procedure

This procedure establishes the minimum safety requirements from all Employees and Contractors to follow while positioning/backing vehicles/equipment. The intent of this procedure is to prevent injuries and damage to property that could occur due to blind spots and undetected movement of personnel and equipment that result from unsafe vehicle/equipment positioning/backing practices. Where backing is unavoidable, spotters shall be used. When vehicle/equipment must negotiate forward turns with restrictive side clearances and where height clearances are uncertain, a spotter shall be used.



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Responsibilities Operator's Responsibilities

Prior to positioning/backing a vehicle/equipment the operator shall:

1. Complete a FLRA card (Field Level Risk Assessment) prior to staging equipment on location and/or positioning/backing a vehicle/equipment.
2. Complete 360-degree walk around of the vehicle/equipment to determine if any obstructions and potential hazards are present.
3. Clear the area of people and objects if possible.
4. Ensure overhead and side clearances are adequate.
5. Obtain guidance from a spotter to help position/backup the vehicle/equipment.
6. Make sure the spotter is aware of all obstacles identified during the initial "walk-around" survey.
7. The operator will discuss the positioning/backing plan with the spotter before proceeding.
8. The operator will establish hand signals with the spotter used for positioning/backing up.
9. Operator to maintain line of site with spotter.
10. The operator shall stop the vehicle/equipment immediately prior to losing sight of spotter.
11. The operator shall stop immediately if an emergency "stop" signal is received from anyone in the area.

Spotters Responsibilities

Prior to acting as a spotter for an operator moving a vehicle/equipment the spotter shall:

1. Complete a FLRA card (Field Level Risk Assessment) prior to participating in the staging of equipment on location and/or positioning/backing a vehicle/equipment.
2. Ensure that the hazards are reviewed on the operator's FLRA card and signed off.
3. The spotter will discuss the positioning/backing plan with the operator before proceeding.
4. Hand signals will be agreed upon and understood prior to positioning/backing.
5. The spotter must remain visible to the operator at all times, never place him/herself in the line of fire, and always ensure a safe escape route is available.
6. Ensure equipment operator is no closer than 1 meter (safe limit approach) from any building, utility and other equipment.
7. Stay alert to recognize and deal with dangerous situations.
8. Wear reflective work wear with high visibility stripes at all times.



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9. Establish a position, clear of the reversing vehicle, whereby the spotter does not have to walk backwards while backing/positioning the vehicle/equipment.
10. Immediately signal the driver/operator to stop if any person or object enters the area behind the vehicle/equipment.
11. Signal the driver/operator to stop when the spotter must change positions while vehicle/equipment is reversing.

25.8 **Signals**

It is important that everyone understands exactly what's being done when moving a vehicle/equipment. This will ensure the safety of everyone involved in the operation. It is important all of the workers involved understand who is directing the move and the procedures to be followed.

It is also very important to designate one spotter so there is no confusion with the signaling procedures. The following represent seven (7) basic signals to assist in vehicle/equipment repositioning.



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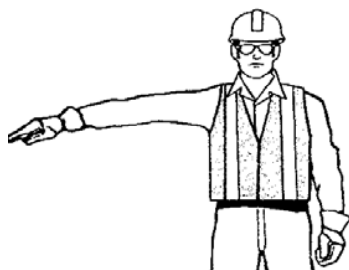
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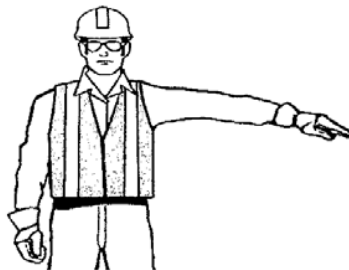
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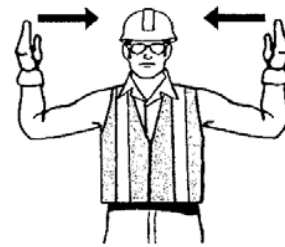
For Use with Excavators and Backhoes



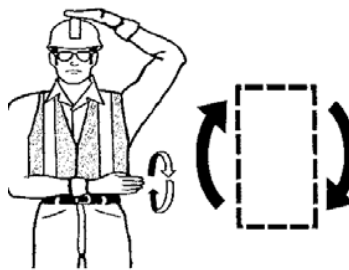
Swing Left



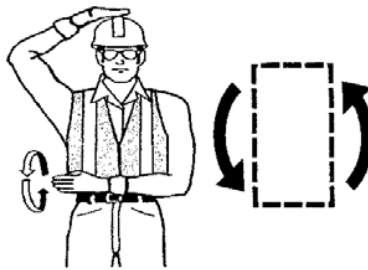
Swing Right



This Far To Go



Counter Rotate



Counter Rotate



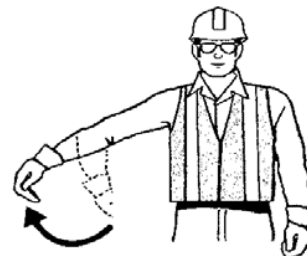
Open Bucket



Close Bucket



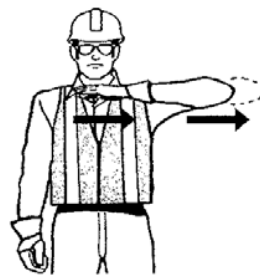
Dipper In



Dipper Out



Emergency Stop



Stop Engine

**NO
RESPONSE
SHOULD BE
MADE TO
UNCLEAR
SIGNALS**



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For Use with All Other Equipment

PROCEED SLOWLY	
FORWARD	BACKWARD
	
Always face palms in the direction of travel desired.	Then both arms repeatedly toward head and chest, and then extend arms.
<div style="display: flex; justify-content: space-around; align-items: center;"> ← URNS → </div>	
	
Point one arm to indicate the direction of turn.	Bend monitoring arm repeatedly toward head to indicate continued turning.



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DISTANCE TO STOPPING POINT



Face palms forward with hands above head. Bring elbows forward and together.

STOP



Cross both arms above head.

EMERGENCY STOP



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Start with hands clasped overhead.
Extend downward repeatedly until vehicle/equipment STOPS



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25.9 Skid Steers

- Make sure machine is good repair.
- Make sure bucket is down and park brake is on before getting off.
- Use care and caution while operating on any slope, and keep bucket as low as possible while doing so.
- Know where all other machinery, obstructions, utilities and personnel are while operating.
- Never work on the machine with bucket in raised position without securely locking it in that position.
- No riders are allowed in the bucket.
- Keep machine on all four wheels as much as possible (don't stunt).
- Keep bucket down at all times when moving machine to various places on the jobsite.
- Make sure back-up alarm is working properly.
- Wear proper PPE
- Wear your seatbelt

25.10 Snow Removal Safe Work Practices

Pre-Trip

- Ensure all PPE is in truck and being worn when required
- Dress according to weather conditions
- Check lights
- Check fluids
- Check break
- Check frame structure
- Check all blade and wing components
- Check hydraulic system
- Unchain the wing for visibility of passenger side mirror (if applicable)
- Complete hazard assessment

Operating Trucks with Blade

- Operate equipment to manufacturers specifications
- Check mirrors and blind spots before moving vehicle
- Operate vehicle as to road and weather conditions, while obeying all applicable laws
- Work from the crown of road to the edge



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- Remain a safe distance from the edge of road
- Control speed to avoid spraying snow on sidewalk
- Position vehicle in correct lane to avoid contact with parked cars and roadside obstacles
- When driving path is obstructed, pick up wing and maneuver around obstacle
- Do not back-up vehicle if not safe to do so. Use a spotter when required
- If snow is not completely cleared from plow route, circle back to complete job
- Avoid raised road obstacles with blade of plow (manholes, road plates, or expansion joints)
- Position wing properly when not plowing
- Adhere to pedestrians and public

Salt Brine

- Follow- procedure for handling chemical (refer to MSDS/SDS)
- Only trained workers are to load salt bins
- Wear face-shield when filling brine
- Do not climb on hopper due to slippery surfaces
- Check spinners and conveyers for build-up of salt or snow
- Do not remove guard on equipment

Ensure that all snow removal vehicles and equipment are equipped with the proper coloured beacon as per jurisdiction

Truck Operation

- Sit in an upright position, with the seat belt fastened at all times.
- Test all braking systems to ensure proper function before operating truck. (Check operator's manual for the correct procedure for your truck.)
- Follow all traffic procedures, signs and speed limits required at the site.
- Test all steering functions prior to operation. (Check operators manual for correct procedure for your truck)

Working Procedures - Operator's Responsibilities

- Safe, productive operation of the equipment with a minimum of down time due to mechanical failure.
- Elimination of property damage and accidents by using care and consideration around other equipment and operators.
- Report unsafe conditions immediately.



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Travel Routes from Loading Area to Dump

- Confirm the designated travel route for your shift with Supervisor
- Know where the loading and dump locations are for your shift
- If you break through the frost at any location on the project radio contact your Supervisor and wait for instructions
- The mechanic should also inspect the truck when possible to confirm no components will be ripped off the truck while removing it

Spotting at Loading Equipment

- Check clearances.
- Visually check loading area on approach to be sure that no equipment or persons are behind your truck before reversing.
- Pay close attention to high-wall areas.
- Watch closely for other equipment, persons, small vehicles, etc....
- Clear communication with excavator/loader operator
- Ensure boom of excavator and/or bucket or loader is raised and out of the way

Dumping

- Make sure truck is level when dumping your load
- Stay away from unsafe or unstable ground that could cause the truck to overturn as it sinks to one side

Spotting at Dump Locations

- Check approach, berm height/thickness (when backing up to a dump, use the berm as a guide only)
- Look for cracked ground, settling, or bulges.
- Report any unsafe conditions immediately to your supervisor and other drivers.
- If spotters are provided, have direct communication with them or visual contact at all times.

Operating on Grades

- Use correct gear when descending on grades.
- Follow the manufacturer's grade profile charts.
- Gear down before descending the grade.
- Use the retarder to maintain proper speed.

Right of Way Procedures

- Follow all traffic procedures, traffic signs and speed limits required at the site.



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- Do not operate the truck in unauthorized areas, follow established haulage routes and use designated parking areas. Watch for overhead obstruction. i.e. power lines, communication lines etc...
- When in doubt, **YIELD**.
- Always yield right of way to loaded truck.
- Always plan for meeting other vehicles and stay away from soft spots, unstable areas or high banks, that could cause you to get too close to other vehicles

Equipment Operators Daily Log

Standard

Operators of heavy equipment are responsible to ensure their equipment has been inspected on a daily basis prior to use. The inspection will be conducted using the Equipment Operators Daily Log Book or equivalent inspection report.

Responsibilities Supervisor

The supervisor is to ensure the following:

- Issue Log books to equipment operators
- That equipment operators are conducting daily inspections of their equipment
- That defective equipment is removed from service so as not to pose a hazard to any employee, public or other materials and equipment
- Report maintenance requirements to the appropriate personnel

Operator

The operator is responsible to ensure the following:

- Operators must complete the daily inspection of their equipment to ensure it is in good operation condition prior to use
- Identify any mechanical issue on the inspection card and notify their supervisor

Procedure

- The equipment operator will inspect their equipment each day before use
- The log must legible indicate any deficiencies, the operators name, date.
- Any equipment with deficiencies serious enough must be removed from service, (lock out tag out may be required) until repaired
- The supervisor will notify the appropriate mechanical personnel that service is needed



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25.11 Pick-up Trucks Standard

These practices involve the more common safe driving practices used during the operation of a motor vehicle.

CF is responsible to ensure employees are provided adequate instruction in correct driving protocols when driving vehicles on rural, private or lease roads. The driver of the vehicle has the responsibility to adjust their driving habits to conform to the existing road conditions.

Employees operating a CF vehicle must have care and control of the vehicle at all times and obey the highway traffic act in your various jurisdictions and follow CF policy on “vehicle rules”.

- All drivers/operators must have a valid driver’s license and will have their drivers abstract reviewed.
- Drivers will conduct an inspection prior to operating the vehicle and will follow regular maintenance as per manufacturer’s guidelines.
- Check all fluid levels; cooling systems, oil, and gas to be sure, they are acceptable levels for operation.
- Do not fuel while it is running.
- Do a walk around to check tires, condition of the truck and that all cargo is properly secured.
- Seat belts must be worn.
- Put vehicle in park and apply parking brake when stopping the vehicle.
- The operator must not drive under the influence of drugs or alcohol. This includes a) blood alcohol level above zero b) illegal drugs c) prescription medication that cause drowsiness or impairment.
- No Smoking in CF vehicles
- No use of hand held electronic devices (ex. Texting while driving)
- Whenever possible drivers will pull-through or back into parking spaces.
- All vehicle incidents must be reported immediately to the main office.

25.12 Fueling Heavy Equipment

1. Ensure proper and operational fire extinguishers are on the fuel trucks and on the heavy equipment.
2. No open flames or cigarettes are allowed in the area.
3. Park fuel truck on level ground.
4. The operator will activate all safety and emergency brakes and will lower all hydraulic accessories such as blades, buckets, etc.
5. Shut off engine.
6. The person in charge of fueling will attach static ground to the unit being fueled. Only then will refueling commence.
7. The operator will wait until the fuel person has cleared the area and gives the operator an o.k. signal



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before restarting the machine and resuming his/her duties

8. Cellular telephones should be shut off while fueling.
9. Spill kits are to be made readily available.

Note: Do not fuel within 30m (100') of any water shed.

Procedure

The storage and use of flammable and combustible liquids must meet the legislative requirements in your area. Gasoline and gas/oil mixtures are flammable liquids and diesel fuel is combustible liquid.

Temporary construction site fuel storage tank requirements must meet legislative requirements to prevent contamination of surface water and groundwater. The following are industry best practices:

- All large fuel storage tanks must be double walled.
- Tanks must be protected from physical damage that could include bumper protection against vehicles and equipment.
- Tanks must be substantially level.
- Area around tanks must be free of combustibles.
- Proper labeling of tanks is required.
- Warning signs need to be posted indicating "No Smoking".
- All dispensing hoses must be inspected for leaks and protected from physical damage.
- Dispensing of flammables shall be by mechanical pump and self-closing valve. Combustibles may be gravity dispensed if self-closing valve is used.
- Spill kit containing absorbency material to ensure immediate cleanup of an accidental spill is readily available.
- Fire extinguisher to be mounted in immediate area.
- Tanks must be located at least 15 feet from any building and/or property lines including roads.
- All tanks must have proper ventilation, spill warning device and an anti-backflow device.
- All fueling operations must be at minimum 30m (100ft) from any watershed.
- All fuel storage areas must provide secondary containment.

25.13 Fuel Storage Requirements

Procedure

The storage and use of flammable and combustible liquids must meet the legislative requirements in your area. Gasoline and gas/oil mixtures are **flammable liquids** and diesel fuel is **combustible liquid**.



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- All fuel storage areas must provide secondary containment.

22.29 Working with Compressed Air Tools

- Compressed air and compressed air tools shall be used with caution.
- Pneumatic tools shall only be operated by competent persons who have been trained in their use.
- Compressed air must not be used for cleaning purposes to blow debris or cleardirt from any worker's clothing.
- Pneumatic tools shall never be pointed at another person.
- All hose connectors must be of the quick disconnect pressure release type with a "safety chain/cable."
- Pneumatic power tools shall be secured to the hose or whip by some positive means to prevent the tool from becoming accidentally disconnected.
- Safety clips or retainers shall be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled.
- Before making adjustments or changing air tools, unless equipped with quick- change connectors, the air



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shall be shut off at the air supply valve ahead of the hose. The hose shall be bled at the tool before breaking the connection.

- A proper pressure regulator and relief device must be in the system to ensure that correct desired pressures are maintained.
- The manufacturer's safe operating pressure for hoses, pipes, valves, filters and other fittings shall not be exceeded.
- The correct air supply hoses must be used for the tool/equipment being used.
- Hoses must be checked on a regular basis for cuts, bulges or other damage. Ensure that defective hoses are repaired or replaced.
- The use of hoses for hoisting or lowering tools shall not be permitted.
- The use of metal-reinforced hose shall be avoided near energized equipment. When this type of hose must be used, proper clearances shall be maintained.
- During operations using compressed air tools, be sure other workers in the area are made aware of or have restricted access to the hazard area.
- The equipment must be properly maintained according to the manufacturer's requirements.
- Follow the manufacturer's general instructions and comply with legislated safety requirements.

25.30 Equipment Lock Out/Block Out Procedure

To effectively disable a piece of mobile equipment from accidentally starting the following guidelines should be followed. Review owner's manual for specific information on the equipment being locked out.

1. Turn the machine ignition off.
2. Remove the key (if it has key ignition).
3. Close and lock the console if it has a cover and place the key in your pocket.
4. If the machine has a push button start, remove the battery ground cable.
5. Repair the machine.
6. After the repair, unlock the cover and replace the key.
7. If you require the machine running to test the repair, stand clear of any hazard locations. Do not approach any moving part while it is running.
8. Blocking of hydraulic cylinders or any other piece of equipment with the potential to move due to gravity.
9. Ensure tires are chocked to prevent unexpected movement.

25.31 Forklifts and Related Equipment

Forklifts and related equipment fitted with forks or lifting devices are widely used in the industry to handle material. General guidance for material handling using this type of equipment is provided below.

Forklifts – Operator Qualifications Standard



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Forklift trucks are to be operated by workers who are trained and competent to operate the equipment.

Procedure

1. The supervisor shall ascertain whether existing forklift operators have the necessary experience and training to operate safely.
2. Those who need training shall be provided with training arranged by their supervisor.
3. A certification card/letter shall be issued by the training agency.
4. Only those workers with certification card/letter or equivalent training may operate forklifts.
5. Operators are to inspect their forklift daily to ensure it is in safe operating condition. Report all unsafe issues to your supervisor. Do not operate an unsafe forklift.
6. Do not permit riders on any forklift.
7. Observe and obey the capacity of the forklift.
8. Place forks as far as possible under load. Drive with load against heel of rack with mast tilted back.
9. Space forks properly to balance and support load.
10. Do not move loads that are poorly piled or stacked.
11. Carry load as low as possible.
12. Match speed to driving surfaces, load and workplace conditions.
13. Travel in reverse when load obstructs forward vision.
14. Watch for overhead obstructions.
15. Operate smoothly and slowly.
16. Park forklift with controls in neutral, brakes applied and forks on the ground with the motor switch off.
17. Do not allow anyone to stand, walk, or work under elevated forks.
18. Operator restraint system (seat belt) shall be worn
19. When raising or lowering a load the forklift must be stationary

Note: The forklift is not to be used as a work platform. Do not hoist any person on the forks.

Forklifts Inspection – See H&S_FORM_045 Standard

Operators of forklifts shall make a daily inspection of his machine prior to use.

Procedure

If any of the following components are defective, the operator shall immediately inform his supervisor.

Inspect general condition of forklift for cleanliness and loose parts, and complete the daily inspection, see H&S_FORM_045.

Forklifts - Propane Fuel (LPG) Standard



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Workers involved in the use of liquid propane gas (LPG) forklifts shall be familiar with their characteristics and the necessary safety precautions.

Procedure

- LPG tanks must be laying down when in use to isolate the fuel from the relief valve.
- The proper and safe storage position for LPG tanks is upright and secure (outdoors only).
- Check to see that the locking pin engages into cylinder.
- Handle cylinders gently; do not drop. Protect valve.
- LPG is "cryogenic" and will freeze skin on contact; therefore, wear protective gloves and safety glasses when making or breaking connections. Do this outside.

Repairs to carburetor or fuel system must be done by authorized and qualified

- workers.
- Change fuel tanks as follows:
 - Close valve on cylinder
 - Run engine until it stops to empty system
 - Shut off engine
 - Open connecting nut with non-metallic tools
 - Disconnect hose
 - Disconnect holding straps
 - Remove empty cylinder
 - Place full cylinder into proper position
 - Connect holding straps
 - Tighten connecting nut (wiggle hose)
 - Check to make sure gaskets are intact
 - Open valve on cylinder slowly and listen for leaks
 - Smell rotten cabbage - shut off cylinder valve
 - If valve leaks:
 - Once -re-follow procedure done
 - Twice -change cylinder
 - Three times -change hose
 - Open valve slowly and fully
 - Check that hose is turned inwards secure hose downward
 - Start motor and resume operation.
- Refer to MSDS for proper storage, handling, PPE and First Aid information.



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Forklifts - Batteries Standard

Workers involved in the use of electric forklifts shall be familiar with batteries characteristics and the necessary safety precautions.

Procedure

- Batteries contain:
 - Sulphuric Acid
 - Electrolytes
 - Water
 - Explosive hydrogen and oxygen gas
- Batteries should be charged in an isolated, ventilated area equipped with an eyewash station.
- Handling battery acid:
 - Wear tight fitting eye protection, gloves, and coveralls
 - Pour acid into water; never pour anything into acid
 - Do not use metallic containers or funnels for acid
 - Splashes destroy most materials
 - Flush eyes for at least 15 minutes with eye wash if splashed; **GO TO DOCTOR** to be sure no permanent damage has occurred
 - Neutralize spills with baking soda
 - Rinse with clean water
 - Do not store acid near heat or sunlight
 - Refer to MSDS for proper storage, handling, PPE and First Aid information
- Exploding batteries:
 - Isolate batteries from sparks, flame, or any source of ignition
 - Shield eyes
 - Do not break live circuits at battery
- Charging batteries:
 - Unplug the charger before attaching or removing clamp connections
 - Attach proper clamp to proper terminal (usually red + and black -)
 - Follow correct procedure (see Section 20: Safe Job Practices – Lead Acid Batteries – Boosting)
- Servicing batteries:
 - Check for worn cables, loose connections, corrosion, cracked cases/covers, loose hold downs or deformed terminal posts
 - Replace worn parts
 - Tighten cable clamps with suitable wrench
 - Use a cable puller to remove clamps
 - Remove corrosion
 - Clean terminals with tapered brush



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- Use a battery carrier to lift a battery
- Do not overfill cells



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Forklifts Maintenance Standard

Forklift maintenance shall be performed by duly qualified mechanics with the necessary safety precautions in mind.

Procedure

1. Disconnect all batteries and propane before any work is done.
2. Clean up spilled oil or hydraulic fluid immediately.
3. Block forklift securely when removing wheels.
4. Support forklift hood in upright position or remove.
5. On LPG forklifts:
 - a. Shut off fuel valve
 - b. Run engine until it stops
 - c. Disconnect tank from hose
6. Check the operator's daily checklist for unreported defects.
7. Test by magnetic particle the main mast welds and forks annually.
8. Replace hoses, couplings, fittings, and connections according to manufacturer's recommendations.
9. Do not work beneath unsupported forks.

25.32 Trucks – Loading and Unloading

Standard

The driver of a truck shall ensure that the load is loaded, transported, and unloaded in a manner that will not cause harm to people, equipment, or materials.

Procedure

- All vehicles carrying loads shall have their load properly secured.
- Loads, which project beyond the length of the vehicle, shall be marked with a red flag or light.
- Workers shall leave the cab of a truck while it is being loaded or unloaded.
- No person shall mount or dismount a moving vehicle or piece of heavy equipment.
- No material or equipment to be moved by crane, forklift, or similar device shall be stored under or near energized electrical equipment.

25.33 Load Security

Loading and securing your cargo/equipment incorrectly could lead to fines, property damage, injury or even fatality(s).



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Loading

Factors affecting arrangement of load:

- Type of vehicle
- Weight of load
- Height of load
- Width of load
- Length of load

Arranging and Distributing Loads

Weight distribution of load affects the handling characteristics of the vehicle. The life of the vehicle's tires, frame, springs and bearing can be greatly reduced by improper weight distribution.

Placement of Load

Heavy concentrated loads should be placed:

- Near the rear of the trailer
- On its long side if possible
- Over or just ahead of the rear axle
- Load should be securely blocked to prevent from sliding forward

An equal amount of weight is placed on all rear tires to prevent twisting and stress on the frame. Ensure that trailer is long enough for load.

Securing Load

The chosen load securement system must be appropriate for the loads:

- Size
- Shape
- Strength
- Characteristics

Securement systems may include:

- Vehicle structure
- Blocking and bracing
- Tiedowns (Chains, Straps, Etc.)



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General Requirements for Tiedowns

- Tiedowns must be designed and maintained to allow the driver to tightenthem (excluding Steel Strapping)



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- Edge protectors must be used where tiedowns could be cut or subject to abrasion where in contact with load
- Tiedowns must be firm and must not slip, loosen, unfasten, open or release while the vehicle is in operation

Tiedowns with the following defect must not be used:

- Chain containing cracked welds or links
- Chains containing bent, twisted, stretched or collapsed links
- Chains links weakened by gouges, nicks or pits
- Chain incorrectly repaired
- Chain links obviously worn or showing other visible evidence of loss of strength
- Knots in any portion of chains, wire rope or webbing
- Spread or distributing grab hooks
- Cuts, slits, nicks in nylon webbing
- Wire cable with missing strands
- Anchor point which is weakened or shows loss of strength due to cracks, breaks or distortion

Light Weight or Fine Particle Material

- Load must be covered entirely by a tarpaulin or other covering so that none of the load can escape from the vehicle. Examples:
 - Sawdust, shavings or woodchips
 - Sand
 - Salt
 - Granular
 - Recycled Asphalt Pavement (RAP)
- Do not use cell phones or other personal electronics while operating any equipment
- Never leave the seat of the machine while still in motion. A signal person will direct the driver.

25.34 Trucks (over 4500kgs/Yellow Sticker)– Daily Inspection

Standard

All trucks shall be maintained in safe working order.

Procedure



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The truck driver shall conduct a daily circle check of his vehicle prior to initial use inspecting the following areas where applicable:



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- All lights and license plates
- Engine oil level
- Radiator coolant level
- Tie rods
- Tires and lug nuts
- Any oil leaks
- Transmission oil level
- Fuel tank level and condition
- Ride cylinders (struts)
- Parking brake
- Drive line
- Steering cylinders
- Air tanks
- Windows and mirrors
- Fire extinguisher shall be installed in all vehicles as per our client's safety policy
- Hydraulic tank and levels
- Horn
- Windshield wipers/washer fluid
- Braking System

Management and operators are responsible to ensure operators of CVOR (commercial vehicle operator's registration) or equivalent commercial vehicles operate as per allowable hours of service referring to your areas transportation enforcement requirements.

Note: Report any unsafe condition to your supervisor for corrective action.



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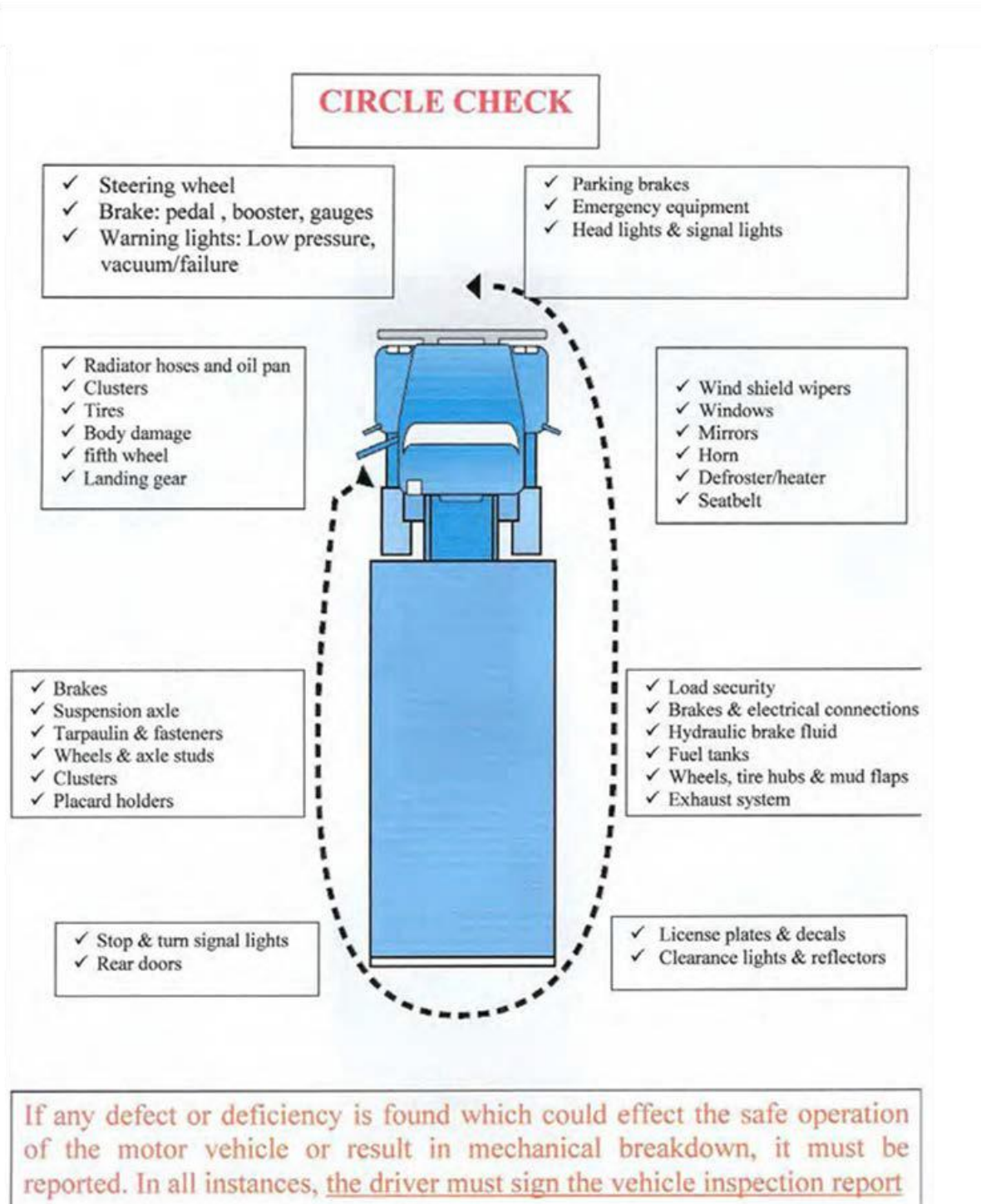
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25.35 Fleet Vehicles – Maintenance Standard

CF pick-up trucks and vans shall be maintained in safe working order.

Procedure

Regular Vehicle Inspection H&S_FORM_040 of CF vehicles shall be done by the operator or other qualified person on a weekly basis as follows:

- All lights
- Tires
- Fluid leaks/levels
- Emergency brake
- Clean windows, good wipers/washer

It is the operator's responsibility to arrange for preventative maintenance:

- Oil and filter changes
- Lubrication
- Tightening of components
- Engine tune
- Brake jobs
- Tire rotation/ replacement
- Replacement of specific engine hoses
- Radiator maintenance
- Spring service for air conditioner

It is the operator's responsibility to arrange for demand maintenance:

- Light bulbs
- Springs/suspension
- Window glass
- Wiper blades
- Wiring
- Gauges
- Tires
- Engine, transmission



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- Battery
- Universal joints

If major repair costs are anticipated discuss with your supervisor for direction.



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25.36 Transporting Dangerous Goods Standard

Vehicles transporting dangerous goods shall have the proper placards and safety requirements in accordance with the applicable legislation.

Procedure

Operator of owned or leased vehicles shall:

- Determine the quantity of dangerous goods.
- Consult the local jurisdiction for exact regulatory requirements.
- Ensure all requirements are followed.

General Requirements

- The operator of the vehicle shall have proper TDG training and carry a valid certified wallet card on his/her person.
- A shipping document, must accompany the dangerous goods. The number of dangerous goods being shipped must equal the number on the shipping document.
- Ensure that there is a fire extinguisher readily available
- All items offered for transport must be in good condition
- Do not ship material in damaged, rusted or leaky pails, drums, or damaged seals
- Do not ship damaged cartons

All dangerous goods must be identified in accordance with the appropriate labels Dangerous Goods are classed as follows:

- Class 1 - Explosive
- Class 2 - Flammable and Non Flammable Gas
- Class 3 - Flammable Liquid
- Class 4 - Flammable Solid Class
- Class 5 - Oxidizing Substance
- Class 6 - Toxic Substance
- Class 7 - Radioactive Materials
- Class 8 - Corrosive Class
- Class 9 - Miscellaneous Products, Substances or Organisms



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25.37 Boom Truck & Crane Operations General Operation Procedure

- Only licensed and qualified crane operators who have been properly instructed may operate the controls.
- Operator must be familiar with operator manual supplied by the crane manufacture. Manual must be available in cab.
- Operator must complete the operator crane log book as required and the Boom Truck / Crane Inspection H&S_FORM_046.
- All outriggers beams (if equipped) are to be fully extended and outriggers pads are to be placed on a solid footing or blocking. All wheels are to be clear of the ground.
- The boom angle, boom length, load radius and the rated capacity must be known by the operator.
- Crane must be set up level.
- The lifting hook is directly above the load's center of gravity.
- Load weight must be known.
- Rigging must be correct for the hoist.
- Crane is set up level on firm, stable ground or blocking. (Crawler Cranes).
- Crane controls should be moved smoothly and gradually to avoid abrupt, jerky movements of the load. Slack must be removed from the slings and hoisting ropes before the load is lifted.
- Be sure that everyone in the immediate area is clear of the load and aware that a load is being moved.
- Do not make any lifts beyond the rated capacity of the crane, slings chains, rope slings, etc.
- Do not operate crane if the limit switches (if equipped) are out of order, or if ropes or other rigging show defects or wear.
- Make certain that before moving the load, load slings, load chains, or other lifting devices are fully seated in the saddle of the hook with the latch closed.
- At no time should a load be left suspended from the crane unless the operator is at the master switches or push button with the power on.
- When two or more cranes are used in making one lift, there shall be only one designated signal person.
- Operator has total care and control of any lifts and their decision is final and must not be influenced or pressured to make any pick he/she feels uncomfortable.
- Weather conditions should be considered when making a lift.
- All cranes must be inspected yearly and recertified by a competent professional engineer.



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25.38 Crane Boom Inspection

A crane boom used for driving piles with a vibratory hammer must be inspected and certified by a professional engineer as safe for continued use

- As required by manufactures specification while it is in use;and
- When not in use, before being returned to hoistingservice.

A crane boom with a vibratory pile extractor must be inspected and certified by a professional engineer as safe for continued use

- As required by manufacturers specification while it is in use;and
- When not in use, before being returned to hoistingservice.

A crane boom used for dynamic compaction must be inspected and certified by a professional engineer as safe for continued use

- As required by manufactures specification while it is in use;and
- Before it is returned to hoistingservice.

The purpose of this procedure is to organize the timely cleanup of lost material on public roadways.

Procedure

When a spill occurs on the way to a jobsite/pit/quarry on a public roadway dispatch is to be notified immediately. The trucking manager/Supervisor will be informed of the situation and organize the cleanup effort. This material must have come from:

- One of our pit/quarry/job sites
- A truck owned by CF, or a hired truck working for CF.

The Fleet shop will then be called to send a technician out to check/repair the vehicle to secure the remainder of the load.

25.39 Trucks Reversing and Dumping Standard

The purpose of this procedure is to install a companywide method for trucks reversing and dumping on site.

Procedure

When a truck (Tandem, Triaxel, or Truck and Dump trailer) is reversing, it should be doing so with the use of a spotter.



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A spotter must be located at the rear of the truck within clear view of the driver at all times. The spotter is responsible for keeping all traffic, pedestrians, and workers clear of the reversing truck.

The spotter will bring the truck to the dump site and check for any overhead objects before the box goes up as will the driver. They will also ensure that the ground is level and sturdy. The full weight of the load will be on that spot and it must be level and not able to move or sink. While the box is rising the spotter should be behind the truck/trailer. NOT BESIDE IT. If the load were to shift or a mechanical failure happen, the box could fall fast and without warning.

The driver of the truck should be in the driver seat of the truck at all times during the operation of the truck. The operation of the truck is when it is being driven, or when it is raising/lowering the box. This is for many reasons:

- The driver can have full and quick control of the box,
- The driver would not be in harm's way if the truck or trailer went over on its side
- The driver would have the protection of the cab if there was a mechanical failure (i.e.: Oil leak, hoist failure, truck PTO pump failure).

It is understood that the driver might have to leave the cab prior to dumping (to open the tailgate, raise the lift axel, check the ground to be sure its level, retract the tarp, etc).

While this is taking place the box is not to be in motion. The truck will be in park with the brakes on. Once the driver has completed their task outside of the truck, then the pump will be engaged and the load dumped.

No spotter is needed if the site has no other activity or the load is for stock piling. The driver must check the site and blind spots for objects and check the ground to be sure it is level prior to dumping.

PPE

All spotters and drivers are required to wear a vest, work boots, hard hat, safety glasses, (reflective arm/leg bands for night work only).

25.40 Dump Truck Safety

- All drivers MUST complete the required pre-qualification documentation
- All drivers MUST complete a circle check and pre-trip inspection before the beginning of work each day.
- Drivers MUST be alert at all times and be aware of congested areas and other construction and mobile equipment. Do NOT park in their path or directly behind any equipment.
- Drivers will receive proper instruction from COMPANY personnel regarding Loading Area, Over-load Dumping Area and Direction to Job Site/Plant location if required. These instructions must be obeyed at all times.



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- All Drivers MUST remain in the cab of their vehicle while being loaded.
- Personal protective equipment including hard hat, safety boots, reflective vest and eye protection must be worn at times outside of cab without exception.
- Drivers MUST obey all Speed Limits on COMPANY property and slow down near construction operations. Drive according to site and weather conditions.
- Drivers MUST adhere to all Posted Signs on COMPANY property.
- All dump trucks MUST be in safe working condition and equipped with a Back-up Alarms.
- All dump trucks MUST have their load TARPED before leaving the job site.
- Drivers MUST be aware of over head wires and not approach within the minimum distances according to jurisdiction.
- Driver is responsible for care and control of their vehicle
- Avoid dumping on unstable ground
- Moving forward with box in the air after dumping is strictly prohibited.
- Dump truck Drivers MUST not reverse unless there is a spotter in place. Check blind spots and mirrors before moving.
- Drivers MUST comply with all applicable company, legislative and Occupational Health and Safety Regulations.
- Drivers must enter the construction zone with caution and use four way flashers and beacon lights. Only merge into live traffic when it is safe to do so.

25.41 Dump Truck Operators On Site/Quarry/Pit Loading Standard

The following steps are a guide line to aid in the safe transport of material and protection of workers and the public.

Procedure

- Ensure mud flaps are in good order
- Ensure load is fully covered
- Ensure tarp is not ripped or torn
- Ensure driver is aware of product and how to properly secure that load
- Ensure load is properly and evenly distributed. If in doubt do not proceed until the load is readjusted
- Compression locks may be used when hauling loose loads (i.e. clay)
- Ensure tailgate is hooked, sealed, and secured
- Ensure side boards are not allowing material to fall out
- Before entering a public roadway ensures that no loose debris is on the truck and no objects are lodged in the dual wheels.
- While inspecting the vehicle wear all appropriate PPE
- Use the peer’s keeper theory on site. If another truck is seen with loose material



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25.42 Loss of Material on a Public Road

Standard

The purpose of this procedure is to organize the timely cleanup of lost material on public roadways.

Procedure

When a spill occurs on the way to a jobsite/pit/quarry on a public roadway dispatch is to be notified immediately. The trucking manager/Supervisor will be informed of the situation and organize the cleanup effort. This material must have come from:

- One of our pit/quarry/job sites
- A truck owned by the Company, or a hired truck working for the Company.

The shop will then be called to send a technician out to check/repair the vehicle to secure the remainder of the load.

Clean Up

The cleanup can be performed by hand or any equipment found near the spill that can be easily diverted from its current task. A vehicle with a 360 degree amber flashing or revolving light and four way blinkers must be present TL-18 (Book 7) set up. If this is not possible a TL-19 (Book 7) set up must be in place or other requirements as per local traffic control / accommodation requirements.

Appropriate traffic control / traffic accommodation must be in place to warn the public of roadwork ahead. Any granular material that is larger than the material used for shouldering at the spill site must be removed. Any type of fill or sand product must be removed from the spill site. If the shoulder is paved all material will be removed from the spill site.

If the spill occurs on a large or busy city road, the local authorities will be called. The road crew of those departments will then control the cleanup of that site. These authorities will be called by the trucking manager/supervisor or someone designated by that person only.

If a load of hazardous material is spilt (asphalt or contaminated waste), the trucking manager/supervisor will set up a TL-19 site or call the proper authority. CF will ensure all material is recovered and the site will be cleaned to pre-spill condition to the best of our ability. Safety should be notified immediately to ensure all environmental regulations are adhered to regarding clean-up and reporting requirements.

PPE

All workers are required to wear vest, work boots, hard hat, safety glasses, and reflective arm/leg bands (night work only). A kit will be put together for road side spills which will include Stop/Slow signs, Brooms, Cones, and Flat head shovels.



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25.43 Operator Competency Checklist

The Operator Competency Checklist H&S_FORM_047 can be used as a tool to review performance and verify knowledge in examining, starting, moving, operating, stopping and parking equipment. The purpose is to make it available for use as a document to record that an equipment operator is aware of the operating requirements of the piece of equipment they are expected to control in a safe manner on our projects.

All evaluators must be competent persons in the use of the equipment and the operations they are observing. Prior to conducting a review using the Competency Checklist the evaluator should verify that the worker has read the operator's manual for the machine they will be using and that they have had any questions answered to ensure that they fully understand it.

The evaluator should also take some time to ask the operator some questions about previous experience and to check that they know what they are talking about.

If after questioning them and having them demonstrate the safe operation of the equipment you have no concerns related to them being able to perform the tasks CF is asking them to do then competency has been displayed.

If you have any concerns, then verification of competency is not possible and the supervisor would need to arrange for additional training through a competent operator as a mentor or another training resource.

25.44 Parking Personal Vehicles on Site

Standard

Parking areas for visitors, workers or others using their personal vehicle will be designated to ensure the safety of the individuals and their property while on the project.

Procedure

When a site has been established, room for parking will be allotted. The Project Manager or site Supervisor will take a quick count of the amount of staff on site and ensure adequate parking areas will be in place. For long term parking area a proper granular base will be installed and graded to allow a level walking surface and multi season use/maintenance. The location of these parking areas may change as the project progresses. But the following criteria will not:

- The staff and visitors will be safe from other vehicle traffic
- Staff will not walk across a major highway to get to work
- Lighting will be provided (where possible)
- The parking area will be maintained (no major ruts, mud holes, etc) Parking area will be large enough

to hold all staff working on site.



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25.45 Concrete and Cement Products/ Concrete Mixer Trucks / Pumptrucks and other Associated Equipment

Standard

To eliminate potential injuries when handling and placing of cement and concrete products. Consult project Waste Management Plan (if applicable)

Practice

- Do not allow cement products to contact your skin. Use personal protective equipment such as rubber boots, gloves, impervious clothing, to protect from prolonged exposure. Where knee pads if kneeling.
- Do not let skin contact cement products. Many products are abrasive or corrosive and may cause skin irritation and injury.
- Wash skin promptly after contact with products containing cement.
- Keep cement and cement products out of eyes. Eye protection such as safety glasses shall be worn whenever working with cement. Eye exposure to cement can cause serious injury. Always flush eyes with water if cement or the mixture gets into eyes.
- Don't breathe cement dust. Crystalline silica is a major component of cement and can cause serious lung injuries. Use the appropriate respirator. See the respiratory protection requirements in this manual – PPE).

Concrete Pouring Operations

Ensure proper planning is initiated at the start of the job. Good Housekeeping is a must.

- Trip hazards (rebar, cords, forms, screw pin etc.) must be removed or covered
- ALL electrical equipment must be properly grounded including use of GFI electrical outlets. Extension cords and vibrators and other equipment must be maintained, in good condition with appropriate grounding
- Always keep the area to be poured clear of debris.
- Eliminate trip hazards; keep electrical cords away from truck or walking / working surfaces

Ramps and Runways

Construct any ramps or runways before moving concrete in wheel barrows. Ensure that these ramps and runways meet the safety requirements.

For example:

- Design and construct all ramps and runways to meet all loads likely to be subjected
- Install guardrails
- Install Toe boards
- Use appropriate slopes when constructing ramps that allow you to control your load.



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Working Around Concrete Trucks

- Never walk under the chute
- Never stand next to a truck on an incline (the rotating mixer could tip over or bank could collapse)
- Keep hands and fingers clear of the chute and other nip and pinch point situations
- For clear communication, only have one person direct the concrete truck operator
- Wear a reflective traffic vest when acting as a back up person (signal person) for the concrete/pumper truck

Concrete Pumping Operations

Pre-pour planning is critical for ensuring a pour goes as planned without unnecessary interruptions. Jobsite conditions such as soil conditions, ground preparation, overhead electrical power lines, adequate access, and egress into the location, Concrete Mixer truck staging areas, traffic control, etc. must be considered prior to the start of this event. A job hazard assessment may help in this situation. See the job hazard assessment section in this manual.

The following should be established:

- Supervisor has been identified
- Power lines have been de-energized or relocated to prevent accidental contact
- Pump operators are to have appropriate clearance from all potential energized power lines before operations begin. **For example (17 feet in USA, in Canada review the voltage to determine the appropriate distance). Note: Always assume the power lines are energized if you cannot confirm the actual electrical situation.**
- Adequate access and egress routes for crew and equipment have been established
- Staging area for Concrete Mixer trucks is essential
- Whenever possible, a level setup area should be established for the pumtruck and Concrete Mixer trucks.
- A clean out area is available for pump and Concrete Mixer trucks
- Adequate lighting established
- Consider the effects of adverse weather conditions on personnel and operations

Communication

Before work begins, clear lines of communication must be established for (i.e. verbal, line of sight, signals, etc.)

- Ensuring a clear line of sight between the Concrete Mixer driver and pump operator/hopper watch person to ensure operator safety while trucks are backing and pulling out
- Maintaining the proper level of concrete in the hopper
- Ensure workers know how to activate the emergency stop alarm on the truck when a problem arises and the location of the emergency stop switches
- Communications between the pump operator and the placing crew



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Hose Selection and Size

Hose selection is most determined by:

- Number of yards per hour to be pumped
- Size of the aggregate/mix design
- Weight of delivery hose
- Ease of use for the hose operator

Be aware, reducing the hose size will increase pressure and could cause plugging.

Air in the System/Plugs/Kinked Hose

- Air in the system can be the result of the hopper level falling too low, allowing air into the system. The end result is a pocket of compressed air moving through the system and out the delivery hose with a possible violent reaction
- Thorough cleaning is essential. A hose or pipe that has not been cleaned thoroughly will reduce the ability of the concrete to flow smoothly and cause a plug
- Proper mix design and proper mixing are critical for pumping
- Debris from the ready-mix truck can get into the system and cause a blockage that results in plugging
- Extreme caution must be taken whenever a system plugs. If a clamp is removed before the operator backs off the pressure, there can be a violent release of concrete straight up at the person performing the task
- Good communication is the key when the system plugs. A clamp should not be loosened until there is a verbal verification from the operator that the pressure has been backed off
- Kinks in the hose line will prevent the continuous flow of concrete and develop sudden increase of pressure that can violently react when released causing the hose to whip in an uncontrolled manner