

STANDARD OPERATING PROCEDURE

Field Servicing of Equipment

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FIELD SERVICING OF EQUIPMENT

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The following is a step by step procedure on how to complete a specific task or meet a facility specific requirement. Standard Operating Procedures (SOPs) are written for all identified critical tasks. By virtue of the hazard or complexity associated with critical tasks it is paramount that the SOP be followed as written. SOPs contain a listing of high-level hazards associated with the task, for detailed hazard analysis reference the applicable Task Hazard Assessments. SOPs do not replace the requirements contained in the NACG Standards, Codes, and Processes nor does it replace the need to comply with required legislation. Section 8.0 references documentation that the worker shall understand before work commences.

1.0 PURPOSE

- To establish a company standard to safely and effectively carry out work as it applies to field servicing of equipment.

2.0 SCOPE AND APPLICATION

- This document applies to all company Heavy Construction Mining operations. Ensure all site specific requirements are being met or exceeded before performing the task.

3.0 HAZARDS AND CONTROLS

- Approaching heavy equipment.
 - Establish a safe approach plan with the operator. Approach from the front cab side and utilize the 50 m/10 m rule at a minimum when approaching mining equipment. Follow 962C-SOP-042 Approaching Equipment.
 - For unoccupied equipment, confirm with supervision that it is safe to approach. Visually confirm there is no operator in the cab or completing their walk around.
- Uncontrolled movement of equipment while being serviced.
 - Follow 962C-SOP-037 Securing Disabled or Parked Equipment in an Operating Environment.
 - Park equipment on flat, level ground. Ground all implements if equipped.
 - Engage park brake. On haul trucks, operators will confirm park brake has been set by checking that interior and exterior park brake indicator lights are illuminated (not flashing). Place "Operator out of Cab" placard in window. Operators are not permitted to engage/disengage the propel switch on haul trucks.
 - Follow 950C-C-028 Hazardous Energy Isolation Code for lockout/tag out. If unit cannot be shut down for servicing, follow 960C-SOP-111 Live Work and the steps outlined in this SOP for servicing equipment when it cannot be shutdown.
 - Wheel chocks must be placed on all rubber-tired equipment. This includes service trucks.
 - Operators are not permitted in the cab of equipment while it is being serviced. (Exception: Operators of hydraulic shovels with a lockout mechanism on the pilot lock are permitted to remain in the cab of the shovel but not in the operator seat.)
 - Operators are not permitted to re-enter the cab of equipment until the service person has signaled the operator that it is safe to do so and they are out of the line of fire.

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- Debris falling from highwall/dig face or dig face failure contacting service truck and or ground personnel.
 - Equipment must be parked a minimum of twice the height of the highwall face away from it for servicing.
 - Service personnel are to approach perpendicularly to the dig face and inspect the face for cracks, sloughing, overhangs and water seepage.
- Explosion or flammable hazards while working with fuel, grease, oils, etc.
 - Turn off all ignition sources other than equipment being serviced.
 - Eliminate all ignition sources such as cigarettes, welding, cutting, cell phones and other non-intrinsically safe devices.
 - No smoking within a minimum 15 metres of equipment and fuel storage areas (observe and follow mine specific smoking rules if greater than 15 metres).
- Slipping and falling while mounting and dismounting equipment or when working on equipment.
 - Follow 4x3 contact rules. Always face the machine when dismounting and mounting.
 - Ensure steps are clean and use caution when stepping on tracks and push arms. If needed, use a ladder instead of machine steps to safely access the unit. Secure ladder from movement.
 - Do not wear traction aids when walking on equipment.
 - Ensure there are handrails in place or an alternative method of preventing falls when working above 6 feet (1.8 metres).
- Tripping or slipping on uneven and slippery ground.
 - Ensure there is adequate light for area.
 - Avoid stepping in ruts or on lumps.
 - Use traction aids in slippery conditions.
 - Do not pull hoses from reels while walking, unwind hose first then carry it to work area.
- Equipment and service truck contact.
 - Service trucks will approach parked equipment and must park a minimum of 10 feet or 3 metres from equipment.
 - Use a spotter in congested areas or areas of low visibility.
 - Equipment may approach service areas if the area is set up as a temporary service area with a protective barrier (i.e. berm) beside the service truck or it is a permanent service area. Service personnel will spot/guide the equipment into service areas. When spotting equipment to the service truck in a temporary service area all personnel must be out of the service truck.
 - Downed equipment or equipment parked during shift change must be parked in a safe set up (i.e. straight line, minimum 1-2 equipment lengths between them).
 - Service truck must be outside of an excavator's swing radius if the unit needs to be repositioned during servicing.

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- Service truck becoming stuck or being operated improperly.
 - Equipment will park in an area that is accessible to the service truck.
 - Service personnel shall notify supervision if the equipment cannot be accessed safely or if the service truck becomes stuck.
 - Service personnel shall be competent to operate the service truck, which includes the appropriate training or licensing for the unit being operated.
- Heavy equipment contacting personnel or other ground hazards when entering the service area.
 - Equipment must be guided in and out of the service area by the service person.
 - Ensure the area is free from hazards and there is a safe path for the truck to travel in.
- Impaired visibility during spotting caused by haul truck lights.
 - Haul truck operators will switch off high beam running lights to low beams during spotting.
 - Service personnel will stand off centre to the haul truck to avoid looking at the lights.
 - Once haul truck has been spotted and is stopped with park brake on, headlights can be shut off and 4-way flashers applied. Always check with the site to confirm this practice is acceptable. Some client sites will not allow haul truck lights to be shut off when truck is running.
- Line of fire when installing / removing lockout on haul trucks.
 - Confirm park brake is engaged and operator is out of cab before installing or removing lockout.

4.0 CHECKLIST

- Attend all preparatory meetings (IE: daily PSI; job scope; review of JSA's and SOP's for the job)
- Complete FLRA cards before starting the work.
- Ensure all personnel involved in the task are aware of the hazards and the controls to be used, as identified in the SOP's; JSA's; and FLRA's
- Conduct a pre-job inspection of all equipment to be worked on and tools to be used.
- Standard of Training required for working on this job: On-the job training.**

5.0 DEFINITIONS

5.1 Company

Means North American Construction Group Ltd. (NACG) and all directly or indirectly owned subsidiary companies, including joint ventures.

5.2 Company Personnel

Includes the Company's employees, officers, directors, agents, associates, consultants/contractors, temporary employees and third-party processors.

5.3 HSE

Refers to the Health, Safety & Environment department.



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5.4 Permanent Service Area (Lube Island)

Stationary, fixed and permanent fuel and lube facility. Equipment is spotted in and out of the facility and serviced mainly from bulk storage tanks.

5.5 Temporary Service Area

Mobile fuel and lube facility set up in a temporary location in the field. Service truck will be parked and set up on flat, level ground in an area that is easily accessible to equipment. Temporary berms or jersey barriers will be placed beside the service truck to act as a guard. Berms shall be approximately 1 metre in height, span the length of the service truck and have adequate cutouts for service personnel to access the equipment safely with their hoses and tools. Equipment will be spotted in and out of the temporary facility. Service truck will be parked with park brake applied and wheels chocked. No personnel will be in service truck while equipment is being spotted or serviced. Equipment will be spotted no closer than 3 metres (10 feet) to berms and jersey barriers.

5.6 Mobile Service Area

Mobile fuel and lube service truck that approaches equipment for servicing. Service truck will follow a safe approach plan and enter into the equipment area only after permission has been obtained from the equipment operator or supervisor (unmanned equipment). Follow procedure 962C-SOP-042 Approaching Equipment. Service truck will maintain a minimum distance of 3 metres (10 feet) away from the equipment at all times and will approach in a safe, controlled manner. Service truck will ensure park brake is applied and its wheels are chocked during servicing.

5.7 Company

North American Construction Group (NACG) divisions, departments or subsidiaries.

6.0 PROCEDURE

6.1 General Notes

- Service personnel will utilize one of the three defined service areas for servicing equipment.
- Equipment will travel in first gear and less than 10 km/hr when approaching service areas.
- Service personnel will follow safe approach rules.
- Ensure there are no sources of ignition within 15 metres of fuel and flammable storage and when fuel is being transferred.
- Always maintain 3x4 point contact when mounting and dismounting equipment, face the machine, ensure steps are clean, and use caution when stepping on tracks and push arms.

6.2 Servicing Mechanical Haul Trucks at Permanent or Temporary Service Areas

- 1) Service person will guide the haul truck into the service area and signal when to stop.
- 2) Operator will disengage the drive system and engage park brake. Ensure park brake light on dash is illuminated. Operator will exit cab with full PPE and remain on deck in view of Service person.
- 3) Service person will confirm exterior park brake light is illuminated and operator is on deck then approach the truck to turn propel lockout switch to the neutral position. Service person will install personal lock, step away from the machine and signal the operator to complete a bump test.

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- 4) Operator will enter the cab, sit in the seat and place the drive system control lever in the REVERSE position. Do not apply throttle and do not disengage park brake for mechanical haul trucks.
- 5) If the drive system does NOT engage, the bump test is successful and the propel lockout works correctly. Return drive system control lever to neutral. **If the drive system engages, stop service procedure and notify supervisor.**
- 6) Operator will confirm park brake is applied and dash light is illuminated (not flashing), install "Operator out of Cab/Is your Park Brake Applied" placard in window, don PPE and dismount haul truck safely. Operator will remain out of line of fire for the duration of the service.
- 7) Service person will confirm exterior park brake indicator light is illuminated and install wheel chocks.
- 8) Service person will complete service as per OEM procedures specific to the unit and advise operator upon completion of service. Service person is responsible for ensuring all tooling and hoses have been cleared from area.
- 9) Operator will complete a walk around to ensure all tools and personnel are clear from the area then safely mount the unit.
- 10) Operator will physically and visually confirm park brake is engaged and all park brake indicator lights are illuminated (not flashing). Upon confirmation, operator will remain on deck in view of service personnel until they receive the all clear signal to enter the cab and leave the area.
- 11) Service person will remove wheel chocks, confirm operator has not entered the cab, remove lock out, and move propel switch to the run position.
- 12) Service person will move out of the line of fire, signal operator that it is safe to enter cab and signal operator out of the servicing area.

6.3 Servicing Electric Haul Trucks at Permanent or Temporary Service Areas

- 1) Service person will guide the haul truck into the service area and signal when to stop.
- 2) Operator will disengage the drive system and engage park brake.
- 3) If the unit is NOT equipped with a ground level park brake switch,
 - a. The operator will shut down the machine, don PPE, exit the cab and stand on the deck.
 - b. The Service person will install personal lock on MASTER SWITCH, step away from machine and signal operator to complete a bump test.
 - c. Operator will enter cab, complete a key test verification to confirm the machine will not start.
 - d. Operator will dismount unit.
 - e. Service person will install wheel chocks and proceed to 6.3 Step #5.
- 4) If the unit is equipped with a ground level park brake switch,
 - a. The Operator will confirm park brake light on dash is illuminated, don PPE, exit the cab and remain on deck in view of Service person.

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- b. Service person will confirm exterior park brake light is illuminated and operator is on deck then approach the truck to turn propel lockout switch to the neutral position. Service person will install personal lock, step away from the machine and signal the operator to complete a bump test.
 - c. Operator will enter the cab, sit in the seat and place the drive system control lever in the REVERSE position. Apply partial throttle do not disengage park brake switch for electric haul trucks.
 - d. If the drive system does NOT engage, the bump test is successful and the propel lockout works correctly. Return drive system control lever to park and apply "rest" mode (apply AC Drive System Rest Switch). **If the drive system engages, stop service procedure and notify supervisor.**
 - e. Operator will confirm park brake is applied and dash light is illuminated (not flashing), install "Operator out of Cab/Is your Park Brake Applied" placard in window, don PPE and dismount haul truck safely. Operator will remain out of line of fire for the duration of the service.
 - f. Service person will confirm exterior park brake indicator light is illuminated and install wheel chocks.
- 5) Service person will complete service as per OEM procedures specific to the unit and advise operator upon completion of service. Service person is responsible for ensuring all tooling and hoses have been cleared from area.
 - 6) Operator will complete a walk around to ensure all tools and personnel are clear from the area then safely mount the unit.
 - 7) Operator will physically and visually confirm park brake is engaged and all park brake indicator lights are illuminated (not flashing). Upon confirmation, operator will remain on deck in view of service personnel until they receive the all clear signal to enter the cab and leave the area.
 - 8) Service person will remove wheel chocks, confirm operator has not entered the cab and remove lock out.
 - 9) Service person will move out of the line of fire, signal operator that it is safe to enter cab and signal operator out of the servicing area.

6.4 Servicing Articulated Trucks at Permanent or Temporary Service Areas

- 1) Service person will guide the articulated truck into the service area and signal when to stop.
- 2) Operator will disengage the drive system, apply the park brake and shut down the engine using proper shut down procedures for the machine model being operated.
 - a. Volvo Articulated Trucks – Delayed engine shutdown switch must be in the ON position. Turn ignition to the '0' position. Apply locks to the Ignition Switch Lockout in the cab of the machine. Do NOT turn the master switch off.
- 3) Operator will note the engine hours, don all PPE, place "Operator out of Cab/Is your Park Brake Applied" placard in window and safely dismount the equipment. Provide engine hours to Service person and remain out of the line of fire for the duration of service.

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- 4) The Service person will install locking device and confirm its effectiveness (bump test) then install wheel chocks.
- 5) Service person will complete service as per OEM procedures specific to the unit and ensure all tooling and hoses have been cleared from area upon completion of service.
- 6) Service person will remove wheel chocks and locking devices and advise operator that service has been completed.
- 7) Operator will complete a walk around to ensure all tools and personnel are clear from the area then safely mount the unit.
- 8) Operator will follow machine start up procedures and service person will signal operator to clear the service area.

6.5 Servicing Haul Trucks and Articulated Trucks at Mobile Service Area

- 1) Service person will ensure the servicing area is safe and accessible for the service truck. If area is not safe service person will request the equipment move to an alternate area or notify supervision.
- 2) Service person will contact and wait for acknowledgement from the equipment operator that it is safe to approach. If unit is unmanned, service person will contact supervision for confirmation that unit is safe and requires servicing.
- 3) Equipment will park twice the height of the highwall face away from it and ensure it is in an area separate from other equipment working.
- 4) Upon acknowledgement from operator, service person will approach within 10 metres (3 metres for construction equipment in a non-mining environment) of the equipment until the operator is out of the cab.
- 5) Operator will disengage drive system, apply park brake, ensure park brake light on dash is illuminated, don PPE and clear service truck for final approach. Operator will exit cab with full PPE and remain on deck in view of Service person. (Note – for Articulated Trucks, unit will be shut down.)
- 6) Service truck will complete final approach from the front cab side of the machine and park no closer than 3 metres to the unit. Service truck will not park in the line of fire. Service person will apply park brake and install wheel chocks on service truck.
- 7) For Mechanical Haul Trucks repeat Section 6.2 steps 3-11.
- 8) For Electric Haul Trucks repeat Section 6.3 steps 3-11.
- 9) For Articulated Trucks repeat Section 6.4 steps 3-7.
- 10) Service person will remove wheel chocks, locking device, advise operator of service completion and leave the area.
- 11) Operator will confirm service truck has left the area before moving equipment.

6.6 Servicing Support Equipment & Excavators under 180T

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- 1) Service person will ensure the servicing area is safe and accessible for the service truck. If area is not safe service person will request the equipment move to an alternate area or notify supervision.
- 2) Service person will contact and wait for acknowledgement from the equipment operator that it is safe to approach.
- 3) Equipment will park twice the height of the highwall face away from it and ensure it is in an area separate from other equipment working. Equipment will lower all implements.
- 4) Upon acknowledgement from operator, service person will approach within 10 metres (3 metres for construction equipment in a non-mining environment) of the equipment until the operator is out of the cab.
- 5) Operator will place the machine's transmission in neutral and apply the park brake. If equipped, engage the hydraulic lockout.
- 6) Operator will note engine hours, don PPE and clear service truck for final approach. Operator will exit cab and remain on deck, if equipped. If not equipped with deck, the operator will proceed to a ground position out of the line of fire.
- 7) Service truck will complete final approach from the front cab side of the machine and park no closer than 3 metres to the unit. Service truck will not park in the line of fire. Service person will apply park brake and install wheel chocks on service truck.
- 8) Service person will install locking device on equipment, confirm its effectiveness, receive engine hours from operator and complete service following OEM procedures specific to the equipment model. Service person is responsible for ensuring all tooling and hoses have been cleared from area upon service completion.
- 9) If at any time an excavator needs to be repositioned for servicing, the service truck must move to the outside of the machine's swing radius until the machine has been repositioned.
- 10) Service person will remove locking device, advise operator of service completion and leave the area.
- 11) Operator will complete walk around and return to equipment.

6.7 Servicing Excavators (180T and larger) and Hydraulic Shovels

- 1) Service person will ensure the servicing area is safe and accessible for the service truck. If area is not safe Service person will request the equipment move to an alternate area or notify supervision.
- 2) Service person will contact and wait for acknowledgement from the equipment operator that it is safe to approach.
- 3) Equipment will park twice the height of the highwall face away from it and ensure it is in an area separate from other equipment working.
- 4) Operator will lower the bucket to the ground and put the pilot control shut-off lever into the locked position then move control levers to perform a bump test. No control functions should work.
- 5) Upon acknowledgement from operator, service person will approach equipment but will not enter the equipment's swing radius until the ladder and fuel tree are deployed and the operator has given permission for final approach.

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- 6) Operator will lower fuel/service tree, exit cab with full PPE and lower access ladder. Operator will return to cab and radio service personnel for final approach. If unit is equipped with a pilot control lock out switch or latching device, operator may remain in cab but out of the operator seat. If no lockout device is present, operator must be out of the cab for the servicing procedure.
- 7) Service person will complete final approach and park no closer than 3 metres to the unit. Service person will apply park brake and install wheel chocks on service truck.
- 8) Service person will mount the machine, install personal locking device and test effectiveness. If there is no pilot control lock out switch/latching device the service person will confirm the controls are in the locked position and place their lock and tag on the cab door in a visible area to prevent access to the cab. Service person will complete service following OEM procedures specific to the equipment model. Service person is responsible for ensuring all tooling and hoses have been cleared from area upon service completion.
- 9) If at any time an excavator or shovel needs to be repositioned for servicing, the service truck must move to the outside of the machine's swing radius until the machine has been repositioned.
- 10) Service person will remove locking device, advise operator of service completion and leave the area.
- 11) Operator will complete walk around and return to equipment.

7.0 NOTES

If this task is to be done by a method different than described in this SOP, the work must **STOP** and the alternate method must be **DOCUMENTED** with an adequate hazard assessment tool such as a JSA. The document must be **APPROVED** by a supervisor before such procedures are implemented.

8.0 REFERENCES

- 950C-C-020 Flammables and Combustibles Storage and Handling Code
- 950C-C-028 Hazardous Energy Isolation Code
- 960C-SOP-111 Live Work - Working on Equipment while it is Running
- 962C-SOP-042 Approaching Equipment
- 962C-SOP-037 Securing Disabled or Parked Equipment in an Operating Environment
- 960C-SOP-200 Fuelling of Diesel and Gasoline Powered Equipment
- 960C-SOP-206 Fuelling of Diesel Powered Equipment form a Bulk Storage Tank with a Wiggins Nozzle

9.0 APPENDICES

No appendices.