CHANGING FLUIDS & FILTERS ON EQUIPMENT

Rev	Status	Rev. Date	Status Description	Prepared by	Reviewed by	Approved by
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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 company 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 changing fluids and filters on 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, visually confirm that no operator is in the cab or in the process of completing a 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.
    - Engage the park brake before exiting the cab. For haul trucks, operators must verify that both the interior and exterior park brake indicator lights are illuminated (not flashing) to confirm the brake is properly set. Place the “Operator Out of Cab” placard visibly in the window. Operators are not permitted to engage or disengage the propel switch on haul trucks.
    - Follow 950C-C-028: Hazardous Energy Isolation Code for all lockout/tagout procedures. If the equipment cannot be shut down for servicing, refer to 960C-SOP-111: Live Work and adhere to the specific steps outlined for servicing haul trucks under live conditions.
    - Wheel chocks must be placed on all rubber-tired equipment, including service trucks, to ensure stability and prevent unintended movement.

- Operators are not permitted to remain in or re-enter the equipment cab while it is being serviced. Re-entry is only allowed once the service personnel have given a clear signal that it is safe to do so and are positioned out of the line of fire.

- Mounting and dismounting equipment.
  - Before mounting or dismounting, inspect ladders, steps, and rungs for damage. Ensure gloves are clean and free of oil or grease to maintain a secure grip. Always face the machine and always maintain three points of contact (the 4x3 rule) while climbing.
  - Secure bags over both shoulders to keep hands free, and do not carry any tools or objects in your hands while mounting or dismounting. Follow 960C-SOP-013 Three-Point Contact When Climbing

- Elevated fluid temperature, with burning fingers or hands from hot oil.
  - Allow fluids to cool down before handling (if allowable).
  - Workers must wear task-appropriate gloves and wristlets that are chemical- and heat-resistant when removing the filter.

- Trip hazards (manual handling of fill hose).
  - Walk forward while pulling the hose toward the work area, ensuring the hose is fully unreeled; do not pull the hose off the reel while walking.

- Contaminating the oil system with dirt.
  - Clean the filter canister cap before removing the bolts. When necessary, raise and secure the box to provide sufficient headroom, preventing the filter from hitting the bottom of the box during removal or installation.

- Contaminating the ground with dripping oil.
  - Ensure a suitable spill tray with adequate holding capacity is placed to collect all overspills.
  - If applicable, remove the drain plugs from the bottom of the filter housings or canisters and drain the oil into a suitable container.

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

6.0 PROCEDURE

6.1 General Procedure

1) Complete a hazard assessment (i.e., FLRA) for the task. Notify your supervisor if you are unsure or if hazards are outside of your control.
2) Approach the equipment and confirm the operator is out of the cab.
3) Apply lockout and ensure hazardous energy is isolated.
4) Install drip trays.
5) Place and secure a ladder if needed to access the work area.
6) Follow the specific steps outlined in the following procedure sections.
7) Remove the ladder, drip tray/filter(s), and tools.
8) Complete walk around.
9) Return the truck to service.

6.2 Removing Fluids from Tanks or Casing (i.e., engine, transmission, hydraulic, steering, torque, and coolants)

1) Shut down and lock out the engine master switch.
2) If necessary, relieve pressure in the system following the OEM procedure.
3) Ensure the waste tank has sufficient capacity to accommodate the amount of waste fluid to be pumped out.
4) Refer to Sections 6.2.1 Quick Connect Systems & 6.2.2 Drain Plug and Filler Spouts.

6.2.1 Quick Connect Systems (if equipped)

1) Ensure the pump flow valves are turned in the correct direction to draw suction from the machine.
2) Clean the quick-connect coupling.
3) Attach the hose and turn on the pump.
4) Confirm the tank is nearly empty (view the sight glass, check the dip stick, hear the change in the pump noise, and the hose is jumping).
5) Shut down the pump and disconnect.
6) Wipe the fittings and return the hose to its hanger or reel it in.
7) Replace the cover on the fitting.

6.2.2 Drain Plugs and Filler Spouts

1) Remove filler cap or fill plug to relieve pressure. Do not place body parts in the line of fire.

2) Place a suitable container to catch the flow and remove the drain plug. If it has an “enviro plug”, install a piece of NPT pipe nipple to open the internal drain valve and drain to a suitable container, or attach the quick-connect of the evacuation system.
3) Use the waste oil hose (without a quick-connect nozzle) to extract the fluid. Alternatively, insert the hose into the fill hole and use the evacuation system to remove the fluid.
4) Replace the plug.

6.3 Remove Filters

1) Close all valves and relieve pressure to the filter area, if applicable. Open the drain valve and drain the oil into a suitable container. Then, close the drain valve.
2) If there is a drain plug on the filter canister, drain it into a suitable container before removing it.
3) Clean the filter housing base and ensure that the old gaskets are removed.
4) Remove the canister by removing bolts or spinning it off. Loosen the bolts or canister, then turn them by hand if it is more ergonomically correct than using the filter wrench.
5) Allow the filter to drain into a suitable container. If it is a top-access canister, lift it partway out and rest it against the side of the canister, allowing the oil to drain into the canister. Remove the filter to the waste filter bin or the used filter storage in the service truck.
6) Apply a thin film of clean oil to the O-rings or seals of each new filter.
7) Ensure there is no pressure in the system caused by overflow or backflow.
8) Install the new filter and replace the canister.

6.4 Fill the System

1) Remove the oil filler cap or inspection plate and fill the oil through the oil fill tube or quick-connect fitting. Refer to OEM capacities (refill) for the correct system oil amount.
2) Do not overfill. Watch the sight glass or the fill hole for the correct level.
3) Follow the engine start-up procedure and inspect the oil filters for any oil leaks.
4) Follow the correct OEM procedure and maintain the oil levels to the correct mark.

6.4.1 Wheel Hubs and Final Drives

1) This task requires two (2) people.
2) Ensure the machine is on level ground.
3) Move the machine until the drain plug is at the bottom and the fill line is level.
4) Shut down the machine, isolate (lockout), and secure against movement (i.e., wheel chocks).
5) Relieve pressure by opening the fill line plug before the drain plug.
6) Remove the drain plug and use a funnel or chute to direct the oil into a barrel.
7) Use the waste oil hose to suck the suitable container dry and connect it to the waste oil tank.
8) Fill through the drain plug until the level reaches the fill level hole.
9) Remove the fill hose and replace the drain plug. There will be some oil loss, so ensure it is captured by the chute or funnel and does not spill to the ground.

6.4.2 Differentials

1) Crack the fill plug to vent.
2) Remove the drain plug and let the water drain into a suitable container.
3) Replace the drain plug and fill through the top hole.
4) Use the sight glass to determine the oil level. Replace the top plug.
5) Use the waste oil evacuation system hose to suck the suitable container dry to the waste oil tank.

6.4.3 Grader Circle, Gear Ring Drive Oil, Chain Case & Excavator Swing Drives

1) Make sure the grader is reasonably level.
2) Remove the level plug to vent.
3) Remove the bottom drain plug and drain into a suitable container.
4) Replace the drain plug.
5) Fill through the level plug.
6) Use the waste oil hose to suck the suitable container dry and connect it to the waste oil tank.

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

- OEM service manual
- 950C-C-028 Hazardous Energy Isolation Code
- 962C-SOP-042 Approaching Equipment
- 962C-SOP-037 Securing Disabled or Parked Equipment in an Operating Environment
- 960C-SOP-006 Safe Use of Ladders and Stairs
- 960C-SOP-013 Three-Point Contact When Climbing
- 960C-SOP-019 Slip, Trip & Fall Hazard Prevention
- 960C-SOP-504 Hand Tools, Use of
- 960C-SOP-212 Field Servicing of Equipment

9.0 APPENDICES

- No appendices.