CHANGING PINNED GROUND ENGAGING TOOLS

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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 working on or changing pinned ground engaging tools on earthmoving 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

- Uncontrolled movement of equipment while working on it.
    - Ensure implements are grounded or supported by a stand/blocking if raised.
    - Ensure equipment is isolated from movement as per 950C-C-028 Hazardous Energy Isolation Code. Operators are not permitted in the cab of equipment during procedure.

- Components, tools and parts dropping and striking the worker.
    - Secure components so they cannot fall (i.e. support with crane, clamps or rigging/sling).
    - Ensure body position, including feet, is not in the line of fire.
    - Place a cart or similar device to catch components when they drop.

- Struck by flying debris when using pneumatic tools to clean teeth, adaptors, parts, etc..
    - Wear a face shield in addition to safety glasses.
    - Wear gloves and clothing that will stop material from penetrating the skin.
    - Follow 960C-SOP-500 Safe use of Pneumatic Tools.

- Struck by flying debris or hammer/tool when using hammer to remove / install parts.
    - The preferred tool of driving the pins is a slide hammer. However, if a sledgehammer and pin driver are to be used, clear the area of all unnecessary personnel. Only the worker handling the pin driver and the worker handling the sledgehammer should be present.
    - Use dead blow or soft headed sledgehammers. **Do not use normal hardened steel sledgehammers.**
    - Punches and hammers must be struck square and in line with the pin.

- Use a fire blanket, rubber matting, etc. to cover the tooth/adaptor area and protect against metal shrapnel/debris from flying.
- Wear a face shield in addition to safety glasses, task specific gloves with adequate cut, impact and puncture protection (refer to 950C-C-049 PPE General Code), and body covering (i.e. leather apron, Kevlar suit or other similar body covering that will stop metal chunks from penetrating the skin). This PPE must be worn by both persons.
- Ensure that the worker holding the pin driver is not in the line of fire to be struck by the hammer.
- Ensure pin driver has a rubber protective donut around the receiving head of the driver.
- Any steel hammer weighing 4 pounds or more and a handle length of 30" or greater will require additional controls such as a larger swing radius and a longer handle on the pin driver.

- Tool failure caused by faulty or damaged tools.

  - Inspect all tools prior to use. Ensure no mushrooming on hammer head and pin driver head. Inspect handles to make sure there are no cracks, splits, or significant nicks; and that they are attached securely to the heads. Remove any damaged or defective tools from service. Dress hammer heads.
  - Only use approved pin drivers to remove pins.

- Musculoskeletal injuries (muscle sprains/strains) and vibration injuries.

  - Stretch before the task and take frequent micro breaks.
  - Ensure pin drivers have flex handles to minimize vibration induced injuries.
  - Use a two person lift or a mechanical lifting aid such as a crane if the parts (i.e. teeth) weigh more than 50 lbs and are awkward to lift/position.

- Materials striking workers entering the area unexpectedly.

  - Flag off area or use barricades while work is being done. If this is not possible, post a person to limit access to the work area.
  - Communicate the process to all workers involved and stress the importance of preventing any outside influences/disturbances.

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

1) Refer to OEM procedure for task, if applicable. Complete hazard assessment (i.e. FLRA) for task. Notify supervision if unsure of task or if there are hazards outside of the worker's control.
2) Inspect tooling. Remove damaged or defective tools from service. Notify supervision.
3) Ensure operator is out of the equipment cab before proceeding. If the operator is required to be in the cab, 960C-SOP-111 Live Work procedure must be followed.
4) Roll the bucket up so the teeth are at a good working height and lower the bucket to the ground. Never position yourself where you could become pinned if an equipment component were to move.
5) Lockout equipment as per 950C-C-028 Hazardous Energy Isolation Code.
6) Identify work area to prevent unauthorized access.

6.1 Removal

1) Clean the material from between and off the teeth with a hammer & chisel, air chipper, or pressure washer.
2) Align the pin driver or slide hammer and start with soft taps to get the pin moving.
3) The person holding the pin driver is to be out of the swing area of the hammer and out of the line of fire of the pin coming out. Drive with only enough force to keep the pin moving until it comes out.
4) On larger machines (i.e. D10/D11 dozer, 120+ ton excavator, shovel), more force is needed. Use a heavy air chipper or pneumatic hammer with a straight punch bit. It may be necessary to strike the end of a pin directly with a sledge hammer to get it moving.
5) Punches and hammers must be struck square and in line with the pin.
6) Inspect the teeth adaptors for cracks or wear and clean as needed. Repair or replace if needed.
7) Clear away all the old teeth and other materials to maintain a clear work area and footing.

6.2 Installation

1) Clean all the adaptors and their pin bores so there is no debris to shoot out when the pin is driven in.
2) Put the pin retainer ring into the slot of the tooth adaptor.
3) Slide the tooth onto the adaptor, making sure the retainer ring stays in place. Large teeth may be a two-person lift.
4) Push the pin in by hand until it won't go further without more force.
5) Drive the pin (preferably with a slide hammer) until the retainer ring seats into the pin groove. Take the same precautions to protect the person with the pin driver as done during the removal.
6) Repeat steps above for each tooth. Place one tooth at a time in order so there will be more room for the slide hammer or pin driver.
7) Clean up the work area.
8) Inspect all tooling after use and repair any damaged or mushroomed tools.

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-049 PPE General Code
- 950C-C-028 Hazardous Energy Isolation Code
- 960C-SOP-500 Safe use of Pneumatic Tools and Compressed Air
- 960C-SOP-504 Safe use of Hand Tools
- 960C-SOP-505 Safe use of Power Tools

9.0 APPENDICES

No appendices.