


STANDARD OPERATING PROCEDURE

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TRACK FRAME REBUILD

						
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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 track frame rebuild.

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

- Equipment contact, property damage and/or personnel injury while moving and transporting track frames and components.
 - The operator will complete a visual inspection of the equipment used to transport track frames (i.e., forklift, loader, skid steer, crane etc.).
 - Spotters will be used when moving track frames in/out of buildings. Spotters will also be used in tight congested areas and will maintain eye contact or use two-way radios to communicate.
 - Travel at slow and controlled speeds. Before moving the frames ensure there are no obstructions and/or obstacles in the way.
 - Stay clear of crushing and line of fire hazards use good communication. Loader operator must ensure ground personal are clear of the load prior to setting track frames in position.
 - Place the track frames on dunnage or steel plates. Do not place track frames directly onto the concrete.
- Track frame assembly and/or parts falling off during transport.
 - Ensure the track frame and/or components are secure and will not shift prior to moving/transporting.
 - Adjust the fork as wide as possible to fit the load and to provide a more even distribution of weight. Space the forks evenly from the center of the track frame to balance the load.
 - Keep the forks 6 to 10 inches above the ground to avoid potential hazards on the ground. Carry the load low and tilted back. Use caution when carrying a load on an uneven surface.

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- Keep the track frame/components low to ground while transporting with the crane and always use a tagline to control the load.
- Ensure all loose parts and components of the track frame are fastened to the frame. Inspect major bogies to ensure the pins are not removed. If the bogie pins are removed during the rebuild process, use ribbon or flagging to identify the pins that were removed.



- Use approved bogie strap/suspension strap to secure suspension to track frame (see Appendix A - for examples of bogie straps).
- Equipment not rated for the load causing equipment failure, property damage and/or injury.
 - Know the weight of the track frames being lifted and remember, mud and material build up will affect the overall weight of the track frames.
 - Approximate weights of different model track frames are listed below. Always reference manufacturer / OEM procedures to identify specific weights for each model and manufacturer of equipment.
 - CAT D8T - 10,360lbs
 - CAT D9T - 9,600lbs
 - CAT D9R - 12,520lbs
 - CAT D10T - 16,020lbs
 - CAT D11T - 25,000lbs
- Dunnage failure and/or dunnage is in the wrong position creating a hazard.
 - Inspect the dunnage condition and ensure it is large enough to support the weight of the track frames. Place dunnage so the track frame rolls over onto the dunnage.
 - Use dunnage that is a minimum of 8" x 8" x 8' and place dunnage behind the frame.
- Rigging failure causing personal injury and/or property damage.
 - Inspect all equipment used to hoist track frames (i.e., overhead cranes, loaders, forklift, etc.).

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- Know the weight of the equipment or components/parts to be lifted and suspended.
- Ensure all rigging, including shackles, hooks, lifting links, and slings are rated and/or exceeds the lifting capacity required for the load to be lifted.
- Thoroughly inspect all rigging components prior to use (i.e., lifting lugs located on the track frames, shackles, slings, cables, press rod bolt holes etc.) (see Appendix C for example of lifting lugs).
- Only competent personnel will rig and signal loads.
- All personnel will maintain a safe distance of at least 1.83 meters (6 feet) from the suspended load. No worker shall stand or pass under a raised load.
- Tagline(s) will be used on suspended loads.
- Operating press tooling resulting in property damage and/or personnel injury.
 - The worker must be familiar with the operating functions of pressing equipment prior to use (refer to 960C-SOP-506 Press Tooling Use Of).
 - The worker is responsible to complete visual inspections on pressing tools prior to commencing work. The worker must also report any conditions affecting the safe operation of the pressing tools to the supervisor.
 - Ensure equipment, parts and components being pressed have been isolated from movement. All parts and components being pressed must be secured to prevent unintentional movement.
 - Personnel must be clear when activating the press, keep body parts out of pinch points and line of fire hazards. If equipped stand behind the press cage.
- Heavy manual lifting resulting in musculoskeletal injuries (sprains/strains).
 - Always stretch before and during the task. Take micro breaks as required when working in awkward body positions.
 - Assess and identify the weight of the load. Be sure you can lift the load without overexertion. Do not lift if you cannot handle the load safely.
 - Do not lift any load greater than 50 lbs. without assistance from another person or a mechanical lifting aid. Follow 962C-SOP-009 Manual Lifting and Carrying Heavy Objects.
 - Use proper body mechanics when lifting (i.e. shoulders and feet square to load, lift with your legs from squat position, keep back straight, and use proper footing).
 - Inspect travel route prior to task; remove tools, dunnage, cords/cables, and other tripping hazards from lift/travel area.

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4.0 CHECKLIST

- Attend all preparatory meetings (i.e., daily PSI; job scope; review of JSA's and SOPs 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) Complete hazard assessment (i.e. FLRA) for task. Notify supervision if unsure of task and if there are any hazards outside of the worker's control.
- 2) Using a minimum of 8"x8"x8' dunnage place approximately 8 feet apart so the forklift fits between. Ensure the dunnage is long enough so the track frame stays on the dunnage after rolling the frames (see Appendix D).
- 3) Install bogie strap/suspension strap to secure suspension to the track frame.
- 4) With a forklift or loader capable of lifting the load, slowly turn the track frame from its rollers onto top side.
- 5) Carry the track frames into the bay. Lower the track frames to blocks to facilitate fork removal (use a spotter).
- 6) Remove the bolts from the rollers and the idlers caps.
- 7) Use proper lifting tools to remove the idlers and the rollers. Pry them loose before lifting.

Note: The crane is not intended to pull the idlers loose.

- 8) To move the frame onto the stands:

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- a) Install adequate lifting links, shackles, bolts in the press rod bolt holes and utilize appropriate slings and shackles to balance the load. Install a tagline(s) prior to lifting.
- b) Pick up the track frame with a crane. Lift it approximately 4 inches off the dunnage, visually inspect the rigging and make sure it is safe to move. Transport the track frame to the work area and lower it on to the stands or blocks.
- 9) Raise bogies with the crane or come-a-long. Insert a wood block between the frame and bogie to eliminate a possible pinch point (sudden drop). Remove the pad assembly and reinstall bolts in frame. clean, and inspect for cracks.
- 10) Move the frame to the wash bay and wash (refer to 960C-SOP-600 Operating Stationary and Mobile Pressure Steam Washers).
- 11) Inspect minor and major bogie pins for wear and inspect for cracks. Refer to service manuals for specifications.
- 12) Repair and replace the tensioner adjuster assembly.
 - a) Stabilize the cannon with a jack or crane and remove the cannon locks. Use a bar and pry the cannon slowly out of the track frame.
 - b) Inspect the tensioner adjuster orientation lock in the track frame.
 - c) Inspect twist resistor keyways on the cannon for wear.
 - d) Inspect track frame cannon seal and main bearing.
 - e) Inspect the tensioner adjuster assembly.
 - f) Inspect the cannon piston.
 - g) Install the cannon into the track frame.
 - h) Install the twist resistors.
 - i) Attach the track frame to the cannon with cable and cable clamps.
- 13) Use a clean-out bolt in all holes on the track frames. If the bolt goes tight, mark the hole to be tapped. Use proper taps (i.e., a 7/8 unc spiral tap is not the same as a common 7/8 unc tap). Blow the holes clean after the bolt or the tap.
- 14) Clean all rollers and idler mounting surfaces, including the track frame and caps seats.
- 15) Install idlers, rollers, and caps. Use proper lifting tools to place the idlers and the rollers.
- 16) Use anti-seize on all bolts and torque the bolts to the proper specs.

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- 17) Using proper lifting tools, lifting links, shackles, bolts, press rod bolt holes, appropriate slings/shackles, and a tagline(s). Raise the track frame off the stands/blocks and move it to the shop overhead door, set the track frame down on stands or blocks.
- 18) Use a forklift or loader and move the frame to blocks (minimum of 8"x8"x8' dunnage and place approximately 8 feet apart). Once again, slowly rotate the track frame (the pivot shaft seal must be facing upwards).
- 19) Replace the pivot bushing (only if they were removed during the rebuild process) and install the pivot seal assembly.
- 20) Install carrier roller assembly and install idle scraper and guards.
- 21) Tension up the track tensioner to ensure it functions correctly.
- 22) Fill the cavity with AST 30 oil and send it to the paint bay.

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

- Alberta Occupational Health and Safety Act, Regulation and Code – Part 21 Rigging
- Alberta Occupational Health and Safety Act, Regulation and Code – Part 6 Cranes, Hoists and Lifting Devices
- Manufacturer's / OEM Procedures (EG: CAT Service Manual)
- 950C-C-022 General Housekeeping Code
- 950C-C 025 Hand Tools Code
- 950C-C-028 Hazardous Energy Isolation Code
- 950C-C-008 Cranes, Hoists and Rigging Code
- 960C-SOP-004 Flagging, Tagging and Barricading Hazardous areas
- 960C-SOP-019 Slip Trip and Fall Hazard Prevention
- 960C-SOP-105 Track Frame Removal - Shop or Field
- 960C-SOP-106 Track Frame Installation - Shop or Field
- 960C-SOP-112 Compressed Air and Air Hoses
- 960C-SOP-401 Raising, Blocking and Lowering Dozers Using Hydraulic Attachments
- 960C-SOP-403 Crane Operation - Shop Bridge & Jib Cranes
- 960C-SOP-506 Press Tooling Use Of
- 962C-SOP-008 Signaling Equipment
- 962C-SOP-009 Manual Lifting and Carrying Heavy Objects

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9.0 APPENDICES

- Appendix A - Example of Bogie Straps
- Appendix B - Examples of Cables Used to Tie Back the Front Frame Assembly
- Appendix C - Lifting Lug Inspection
- Appendix D - Staging Dunnage & Flipping Track Frame
- Appendix E - Track Frame Rigging Example

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Appendix A Example of Bogie Straps

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Bogie straps installed on a D8 track frame.



Bogie straps installed on a D9 track frame.



Bogie straps installed on a D10 track frame.



Bogie straps installed on a D11 track frame.

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Appendix B Cables Used to Tie Back the Front Frame Assembly

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Appendix C Lifting Lug Inspection

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Inspect the lifting lug located on the center of the track frame. Ensure to clean up any built-up material. Look for cracks, broken welds, bent lugs, discoloration, and any other structural defects that may cause the lifting lug to fail.



Example of a good lifting lug.



Example of a lifting lug failing during lifting operations.

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Appendix D Staging Dunnage & Flipping Track Frame

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Place dunnage 8 feet apart.



Place track frame on dunnage.



Use the equipment and roll the track frame.

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Appendix E Track Frame Rigging Examples

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