VERTICAL MOUNT DISMOUNT MULTIPIECE WHEELS WHILE ON VEHICLE

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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 vertical mounting and dismounting tires with multi piece rims while on an Off-the-Road (OTR) vehicle.

2.0 SCOPE AND APPLICATION

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

3.0 HAZARDS AND CONTROLS

- Equipment falling off jacks and stands.
    - Use jacks rated for the weight of the equipment and install under manufacturer designated lifting points.
    - Isolate all forms of hazardous energy and use wheel chocks on the opposite side of the equipment being jacked.
    - Never support an axle end with a jack by itself. Use stands with sufficient safe working load or cribbing to support the equipment. Jack stands with load holding rings or u-rings may be used to support the load providing personnel are not under the equipment.
    - Avoid excessive inward pressure from tire manipulator when pushing on bead seat band/flange to expose O-ring and lock ring. Excessive pressure can cause the equipment to displace position on the stands. Do not over push.
    - Do not push or pull too aggressively when removing tire from vehicle.

- Uncontrolled movement of equipment.
    - Isolate all forms of hazardous energy and use wheel chocks on the opposite side of the equipment being jacked.
    - Inspect equipment prior to use.
    - When using tire manipulators to install/remove tires and wheel components:
        (a) Do not stand in the line of fire.
        (b) Do not stand under manipulator arms.
        (c) Ensure Park brake has been set before exiting tire manipulator.

- Tire rupture during installation and removal of tires and wheel components.
    - Ensure tire-wheel assemblies are fully deflated prior to removal. Run a wire down the valve stem to remove obstructions that would prevent full deflation.

- Do not stand in the line of fire or trajectory zone when inflating tire.
- Do not clamp the hands of the tire manipulator on the tire during inflation.

- Noise exposure when deflating tires.
  - Wear hearing protection when deflating tires. Double hearing protection may be required for tires with super large bore or larger valve stems; alternatively, a muffler may be used to reduce the noise.

- Contact with foreign objects when deflating tires.
  - Do not stand in the line of fire, always stand to one side to avoid contact with dirt and debris.

- Pinch points during installation and removal of wheel components.
  - Use tooling to keep hands and fingers away from pinch points.
  - Do not use fingers to remove O-rings.
  - Use lock ring catcher to support lock ring during removal and installation. Do not use hands to hold lock ring in place.
  - Do not use fingers to pry lock ring out of groove. Lock rings are under tension and can spring from grooves resulting in injury.
  - Do not place hands or fingers near the lock ring split.
  - Ensure tire manipulator or truck mounted crane does not move when applying inward pressure to bead seat band/flange. Tire manipulators must have park brake engaged. Truck mounted cranes must use load holding valves.
  - Never use hands or fingers to insert or remove spacers.

- Line of fire when removing lock ring.
  - Do not allow lock ring to fall to ground, use controlled movement to lower to the ground.
  - Use more than one person to control the lock ring if load is too heavy or awkward.
  - Place lock ring away from work area and stack correctly to minimize the potential of falling.
  - Do not attempt to stop or catch a lock ring if it is falling to the ground.

- Tool failure.
  - Inspect all tools prior to task and ensure they have been calibrated as required.
  - Ensure bead breakers are set up correctly and locked at a right-angle position to the rim. The bead breaker clevis must be snug with the rim and both feet should be touching the side ring flange.

- Injuries caused by using bead breaker.
  - Do not stand in front of bead breaker when using.
  - Do not hold onto pressurized bead breaker hoses; ruptured hoses can cause oil injection injuries.
  - Wear hearing protection.

- Uncontrolled work area
    - Communicate with co-workers involved in the removal-installation process.
    - Keep work area clear of unnecessary personnel, erect barriers as required.

4.0 CHECKLIST

- ☐ Attend all preparatory meetings (IE: 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

6.1 Dismounting Tires with Multi Piece Rims

1) Complete a hazard assessment (i.e. FLRA) for the task. Notify supervision if unsure of task or if there are any hazards outside of the worker's control.
2) Inspect all tools before use. Tag out and remove from service any tool that is damaged or defective; follow up with supervision.
3) Isolate hazardous energy on unit and install wheel chocks on the opposite side of the vehicle being jacked.
4) Lift the axle using an approved hydraulic jack with sufficient lifting capacity. Ensure jack is positioned under manufacturer approved lifting points, refer to manufacturer service manuals. Follow 960C-SOP-801 Jacking Large OTR and Haulage Vehicles. Use stands and/or cribbing to support load, never support an axle end with the jack by itself. Jack stands with load holding rings or u-rings may be used to support the load providing personnel are not under the equipment.
5) Remove valve core or core housing and deflate tire completely. Do not stand in front of the valve stem. Use a deflator with muffler if the valve stem is super large bore or larger.
6) Insert wire into valve assembly to ensure complete deflation.

7) Install and secure the appropriate lock ring catcher to the wheel assembly. ***A documented hazard assessment must be completed if a lock ring catcher is not available.*** NOTE: For the inside rear wheels where the lock ring catcher cannot be installed, use the rear driver assembly to act as the ring catcher.

8) Unseat bead band to expose O-ring and lock ring by using a wheeled manipulator or truck mounted crane to apply inward pressure on the bead seat band / flange with the manipulator pads. Ensure the O-ring and lock ring are easily accessible. Do not over push.

9) Ensure the tire manipulator is secure and will not release inward pressure on the assembly. Apply Park brake.

10) Use lock ring bars to dislodge lock ring from lock ring groove. Start at the split in the lock ring.

11) Lower the lock ring to the ground and place in a safe, suitable location away from the working area. Use an additional person if it cannot be lowered safely by one person. Do not allow the lock ring to fall to the ground. Keep hands and fingers away from split in lock ring and between ground and lock ring. Remove the lock ring catcher.

12) Insert an O-ring pick, screwdriver or tire iron under the O-ring and pull it free from the O-ring groove.

13) Remove tire manipulator.

14) Use a hydraulic bead breaker or a hydraulic cylinder to break the back bead from the rim base. If necessary, position a spacer in the gap between the rim base and the side ring flange.

15) Once the bead is completely broken, remove the cylinder and/or the bead breaker and any spacers.

16) Clamp the assembly with the tire manipulator and gradually remove the tire from the wheelbase. Place on ground or floor with the bead band and flange facing upward.

17) Remove the back side ring flange from the rim and set it outside work area

18) Use a hydraulic bead breaker to remove the bead band and flange from the front bead. If necessary, position a spacer in the gap between the rim base and the side ring flange.

19) Thoroughly clean the wheel and all wheel parts with a wire brush inspecting all parts for cracks, excessive wear, or other abnormalities. Replace parts if necessary. Pay close attention to O-ring groove, lock ring groove and all welded areas while inspecting.

6.2 Mounting Tires with Multi Piece Rims

1) Install back flange on wheelbase. Ensure concave side is facing TOWARDS the machine.

2) Lubricate both beads with a non-oil-based lubricant.

3) Add “liquid tire life” if applicable, review SDS for product.

4) Match all wheel components.

5) Use tire manipulator to install tire onto wheelbase until it makes contact with the back side ring flange. Use care not to curl or distort beads.

6) Install the front flange ring. Ensure concave side is facing AWAY from the machine.

7) Lube bead seat band where it contacts O-ring and install the bead seat band on wheel.

8) Use wheeled manipulator or truck mounted crane to apply inward pressure on the bead seat band / flange with the manipulator pads. Ensure the O-ring and lock ring grooves are exposed. Do not over push.

9) Ensure the tire manipulator is secure and will not release inward pressure on the assembly. Apply Park brake.

10) Install the O-ring in the O-ring groove and use a tire iron or screwdriver to make sure it is properly positioned. Never use your fingers or hands to install the O-ring.

11) Install the lock ring with the aid of the lock ring bars and lock ring catcher. Position split in the lock ring opposite the valve stem and guide the lock ring into the groove with a soft steel hammer or rubber mallet. Be careful not to distort the lock ring. ***A JSA must be completed if a lock ring catcher is not available.***

12) Slowly release pressure on the tire manipulator.

13) Inflate the tire to five (5) PSI while ensuring the assembly seats properly. Do not stand in the line of fire or trajectory zone. Tap the lock ring with a soft steel hammer to ensure proper seating.

14) Continue to inflate the assembly until the beads of the tire and wheel components are properly seated. Do not stand in the line of fire or trajectory zone.

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 12, Section 193, Tire Servicing
- Alberta Occupational Health and Safety Act, Regulation and Code – Part 14, Sections 208 & 209, Lifting and Handling Loads
- Tire Industry Association Earth Mover Tire Service Training Program – Module 8 – Service Five Piece Rim on Machine
- Equipment Manufacturer Service Manuals – Disassembly and Assembly of Wheels
- 960C-SOP-801 Jacking Large OTR and Haulage Vehicles
- 960C-SOP-504 Hand Tools; Use of
- 950C-C-028 Hazardous Energy Isolation Code

9.0 APPENDICES

- No appendices.