REPAIR OF TUBELESS RADIAL TIRES PASSENGER THROUGH LARGE OTR

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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 the repair of tubeless radial tires for passenger vehicles up to and including large Off-The-Road (OTR) vehicles.

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

- Uncontrolled movement of equipment.
    - Isolate all forms of hazardous energy and use wheel chocks.
    - 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.
        (d) Follow 960C-SOP-806 Manipulator Use to Remove and Install Tire Wheel Assemblies.
- Tool failure.
    - Inspect all tools prior to task and ensure they have been calibrated as required.
    - Only use impact sockets with impact wrenches.
    - Fit test sockets on wheel nuts by hand prior to removal to ensure proper socket size.
    - Clean all studs and nuts with a wire brush prior to removal.
    - Keep work area clear of unnecessary tools and equipment.
- Tire rupture during installation and removal of tires and wheel components.
    - Ensure tire-wheel assemblies are fully deflated prior to mount-dismount. 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 a tire.
    - Use appropriate restraining devices (i.e., tire cages) when inflating tires for inspection.

- 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.
- 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.
- Uncontrolled work area.
    - Communicate with co-workers involved in the removal/installation process.
    - Keep work area clear of unnecessary personnel, and erect barriers as required.
- Working with hazardous products/substances (liquid buffer, vulcanizing cement).
    - Use products in a well-ventilated area.
    - Avoid prolonged exposure to vapours; do not inhale vapours.
    - An air-purifying respirator must be worn if a product is to be used in areas with poor ventilation.
    - Review SDS and wear task-appropriate PPE.
    - Do not use near heat, sparks, open flames, or hot surfaces.

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 SOPs; JSAs; and FLRAs.
- ☐ 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 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) Mark the sidewall of the tire with chalk or paint marker to indicate valve stem location prior to dismounting tire from wheel assembly.
4) Follow the appropriate Standard Operating Procedure (SOP) for dismounting the type of tire being repaired.
5) Clean and inspect the wheel, valve stems, and all other hardware for cracks, wear and/or abnormalities, replacing damaged items as necessary.
6) Place the dismounted tire on a tire spreader if possible and inspect the entire casing for signs of run flat or other abnormalities and replace tire if beyond repair.
7) Adequately secure tire and inflate the tire to 20-30 psi. Monitor tire for noises or visual abnormalities.
8) If a leak is difficult to identify, place the tire assembly in a dunk tank if available and observe for escaping air bubbles (tires up to medium truck only).
9) If a dunk tank is not available, spray tire with a soap and water solution and observe for escaping air bubbles.
10) If a leak is identified, mark the source with tire chalk or paint marker.
11) If the test indicates a valve or O-ring leak, replace defective item as required.
12) If wheels have valve-mounted sensors, break the bead at 180º from valve. If wheels have wheel-mounted sensors, break the bead at the valve stem.
13) If the damaged area is too large for in-house repair, take appropriate measures to send it out for possible section repair.
14) Mark the inner liner in a cross pattern with tire chalk or paint marker at the damaged area and note the appropriate size of radial patch required for repair.
15) Using the appropriate reamer, ream the damaged area from the outside of the tire to accommodate the appropriate insert or unseal patch.
16) When an insert or unseal patch is used, lubricate the insert lightly with vulcanizing fluid (Refer to SDS) and pull through the reamed hole using an insert tool. Leave approximately 1/8" of the insert protruding through the inside of the tire casing.
17) If the damage won't accommodate an insert and a patch or if using an unseal patch, skip steps 18 & 19.
18) Buff the inner liner of the casing to accommodate the required size of patch.
19) Vacuum out or remove loose rubber or other foreign materials from inside casing.
20) Clean the buffed area with a liquid buffer. Refer to SDS.

21) Apply a thin layer of the appropriate vulcanizing fluid over the buffed surface, being careful not to let the fluid pool. Refer to SDS.

22) Allow vulcanizing fluid to dry. Clean hands before handling patches.

23) If an unseal patch is used, remove protective wrapper and push insert through the hole in casing and pull from outside.

24) If a radial patch only or radial patch and insert are used, remove protective wrapper and install in vulcanized area, ensuring the patch is centered over the damaged area.

25) Using a stitcher, stitch the patch in place while moving from the centre of the patch to the outer edge on one side. Return to the centre and stitch from the centre to the opposite side. Maintain even pressure with the stitcher.

26) Mount the tire back on the wheel, ensuring the sidewall indication mark is lined up with the valve stem and following the appropriate mounting Standard Operating Procedure for the type of tire being repaired.

27) Inflate tire to manufacturer's specifications and check for leaks using a solution of soapy water.

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
- Equipment Manufacturer Service Manuals
- Jack Manufacturer's Operation Manual
- 960C-SOP-501 Rad Gun Use
- 960C-SOP-503 Hy torque Wrench; Use
- 960C-SOP-504 Hand Tools; Use of
- 960C-SOP-806 Manipulator Use to Remove and Install Tire-Wheel Assemblies
- 960C-SOP-824 Torquing of Tire-Wheel Assemblies
- 950C-C-028 Hazardous Energy Isolation Code

9.0 APPENDICES

- No appendices.