BLOCKING AND REMOVAL OF BLADE AND PUSH ARM ASSEMBLY CAT DOZERS

1	APP	Mar 27, 2025	Approved	Andre Brule	Tammy Siver	John Peck
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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 blocking and removal of blade and push arm assemblies on Caterpillar dozers.

2.0 SCOPE AND APPLICATION

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

3.0 HAZARDS AND CONTROLS

- Uncontrolled movement of the dozer and blade.
    - This is a Live Work task. Follow 960C-SOP-111 and ensure an additional hazard assessment is completed and approved by the supervisor prior to the task.
    - Do not place body parts in the line of fire with equipment or within pinch or crush points of the machine, blade, blocking, or stands.
    - Select the primary spotter. Establish a communication plan with the dozer operator.
    - Ensure that only essential personnel are present in the work area. All non-essential workers must clear the area.
    - The dozer operator will exit the machine while the blocking is being moved into place.
    - Place flagging or barrier tape around the area to establish an exclusion zone during the activity. Ensure no person, equipment, or materials are in the exclusion zone while the machine is being raised or moved.
- Cribbing/ blocking failing under load resulting in injury and/or property damage.
    - Know the weight of the equipment and/or components to be cribbed.
    - Inspect the blocking condition and ensure it is large enough to support the weight of the equipment/components. Check for any signs of settling, slippage, cracking, bending, crushing, or shear failure. Once the blocking and/or cribbing structure is in place, inspect it as frequently as possible.

- When building a cribbing structure, always limit its height to two times the width of the structure. In the case of a non-square cribbing structure, apply this rule using the smallest width.
- Follow 960C-SOP-408 – Cribbing & Blocking Equipment

- Exceeding personal limitations when manually lifting, holding, or positioning cribbing blocking.
  - Stretch before completing the task and ensure muscles are warmed up.
  - Utilize proper body mechanics when lifting and positioning cribbing and blocking (i.e., shoulders and feet square to the load, lift with your legs from a squat position, keep your back straight, and use proper footing).
  - 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.
  - Inspect the travel route prior to moving cribbing/blocking and/or jacks into position. Remove tools, dunnage, cords/cables, and other tripping hazards from the travel area.
- High-pressure hydraulic oil causing injection injuries, burns, and equipment damage.
  - Follow 950C-C-028 Hazardous Energy Isolation Code and the specific de-energizing and hydraulic oil pressure bleeding procedures outlined for the Caterpillar machine being used.
  - Ensure the hydraulic system is de-energized according to the manufacturer's instructions to prevent unexpected movement or hydraulic failure.
  - Properly bleed down the hydraulic oil pressure before proceeding with any hose or cylinder disconnection to eliminate the risk of injury or damage from trapped pressure.
  - Use an effective barrier, such as a protective shield or other safety equipment, to shield the body from any potential residual hydraulic pressure when disconnecting hoses or cylinders.
- Inadequate lifting equipment, rigging failure due to sharp edges, defective, or under-rated.
  - Inspect the crane and rigging prior to use. Remove any defective or damaged rigging or equipment.
  - Before rigging, inspect the equipment for any sharp edges that could cause damage to rigging materials or pose a hazard during lifting operations.
  - Use protective padding, such as rubber or cloth covers, to shield rigging from sharp edges
  - Ensure that the rigging is properly sized and positioned to avoid direct contact with sharp edges. Use taglines or slings to maintain proper alignment.

- Verify the weight of the blade and confirm that the crane and rigging's load capacity meets or exceeds the required weight specifications for the blade.

- Environmental contamination or spills when disconnecting hoses and cylinders.
  - Place a spill tray, absorbent pads, or other suitable materials in the area to catch any fluid that may leak or spill during the disconnection of the hose or cylinder.
  - Inspect hydraulic hoses, connections, and cylinders for signs of wear or potential leakage prior to disconnection.
  - Immediately clean up any spills using absorbent materials and dispose of them in proper bins.

- Working within safe approach limits of equipment.
  - This is a Live Work task; adhere to the requirements outlined in 960C-SOP-111**.** Ensure that an additional hazard assessment is completed and approved by your supervisor before commencing the task.
  - Always stay within the operator's line of sight. Never enter areas behind the machine or where the operator cannot see you.
  - Use flagging or barrier tape to clearly mark the area and establish an exclusion zone around the equipment. Ensure that no personnel, equipment, or materials are within the exclusion zone when the machine is being raised or moved.

4.0 CHECKLIST

- ☐ Attend all preparatory meetings (i.e., 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 Safety

NOTE: This task requires two personnel: the Machine Operator and the Ground Person/Signaler. Both individuals must be adequately trained and deemed competent to perform the task.

1. This is a live lockout task. All persons involved will review and agree upon the steps and actions to be taken to raise and lower the machine. A live work checklist must be completed, and an agreed-upon method of communication must be established.

2. Use barricades, flagging, and tagging to secure the perimeter of the work area, preventing unauthorized personnel from entering. Follow 960C-SOP-004: Flagging, Tagging, and Barricading Hazardous Areas.

3. The Supervisor will review the task with the workers involved, and each worker will complete an individual hazard assessment (e.g., FLRA) and sign off on it.

4. Review the Caterpillar procedure for model-specific blade removal.

6.2 Blade Removal Procedure

1. Ensure the work area is free of debris, clearly marked, and properly barricaded to prevent unauthorized access.

2. Position the machine to ensure clear and safe access for the procedure, ensuring that the work area is stable and secure.

3. Place spill containment materials under the machine to catch any potential fluid leaks or spills that may occur during the procedure.

4. Obtain and inspect blocking materials to ensure they are in good condition and capable of safely supporting the equipment throughout the operation.

5. Place blocking on both sides of the machine, ensuring the blocking is securely positioned near the blade and pusharms to provide stable support.

6. Clear the area and start the machine. The primary spotter will instruct the dozer operator to raise the blade approximately 18 inches, ensuring all safety procedures are followed during machine startup

7. The dozer operator will exit the cab.

8. Using caution, slide the blocking into position under the blade, ensuring it is placed near the pusharm knuckle for optimal stability and support.

9. Ensure that the blocking is positioned to prevent obstruction of the blade pusharm pins, allowing for safe and unobstructed pin removal.

10. Clear the area of personnel. The dozer operator will enter the cab.

11. The primary spotter will instruct the dozer operator to lower the blade onto the blocking, ensuring the lowering process is done slowly and with full control to avoid any sudden movements or instability.

12. With the machine shut down, turn the key to the "on" position and cycle the hydraulic actuator through all positions to relieve residual hydraulic oil pressure. Follow 950C-C-028 Hazardous Energy Isolation Code and lock out the machine.

13. Safely disconnect and remove the tilt circuit hoses from the dozer, ensuring all hydraulic lines are properly secured and fluids are contained.

14. Using a crane and properly rated rigging, remove the pusharms at the trunnion. Ensure that the pusharms are carefully lowered onto the blocking.

15. Disconnect the stabilizer link from the machine end. Using an appropriate lifting device, securely attach the stabilizer link to the blade to prevent accidental movement.

16. Reconfirm that the tilt circuit hoses are fully removed from the dozer and that all hoses are properly stowed to prevent tripping hazards.

17. Clear the area of personnel, remove locks, and start the machine.

18. With caution, back the machine away from the removed blade assembly, ensuring that all movements are slow and controlled to maintain machine stability and safety. Safely position and ground the ripper implement as required, following all operational safety protocols to secure it in place. Shutdown machine. Follow 950C-C-028 Hazardous Energy Isolation Code and isolate hazardous energy.

6.3 Blade Installation Procedure

1. The primary spotter will instruct the dozer operator to position the machine to provide clear and safe access to the installation area. Ensure the machine is stable and the work area is secure. Follow 950C-C-028 Hazardous Energy Isolation Code and isolate hazardous energy.

2. Safely install the tilt circuit hoses onto the dozer, ensuring all connections are secure and properly tightened to prevent fluid leaks.

3. Using a crane and properly rated rigging, carefully position the pusharms at the trunnion. Ensure the pusharms are safely lowered onto the blocking positioned at a safe distance from the track frames.

4. Securely attach the stabilizer link to the blade using a lifting device. Make sure the stabilizer link is properly connected to the blade

5. Using the machine, lift the blade into position, ensuring it aligns with the pusharms and stabilizer link. Exercise caution to avoid any sudden movements that could destabilize the components.

6. Carefully reconnect the blade lift cylinders to the blade. Ensure the connection is secure and that the cylinders are correctly aligned to allow smooth blade movement.

7. Once the blade is in position, use blocking to provide support under the blade, ensuring it is stable and correctly aligned with the pusharm knuckles.

8. Gradually lower the blade onto the blocking, ensuring slow, controlled movement to maintain stability throughout the operation. Verify that the blade is resting securely on the blocking.

9. Reconnect the tilt circuit hoses to the dozer, ensuring all connections are properly tightened to avoid any hydraulic fluid leaks.

10. Verify that all components, including the blade, pusharms, and stabilizer link, are properly aligned and securely fastened. Make any necessary adjustments.

11. Inspect all hydraulic connections and hoses for any potential fluid leaks. Ensure that the system is functioning correctly and that there are no visible issues with the installation.

12. Clear the area of personnel, start the machine.

13. With the machine operator in control, test the blade's movement to ensure all hydraulic systems are functioning properly. Confirm that the blade can rise, lower, and tilt smoothly without any obstructions.

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
- 950C-C-028 Hazardous Energy Isolation Code
- 960C-SOP-004-Flagging Tagging and Barricading Hazardous Areas
- 960C-SOP-111 Live Testing, Working on Equipment while its Running
- 960C-SOP-401 Raising, Blocking, Lowering Dozers Using Hydraulic Attachments
- 960C-SOP-408 - Cribbing Blocking Equipment
- 962C-SOP-008 Signaling Equipment
- Caterpillar SIS Procedures

9.0 APPENDICES

No appendices.