

STANDARD OPERATING PROCEDURE

Shop Removal and Installation of Bottom Guard (Bottom Stump Pan/Belly Pan) on Dozers

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SHOP REMOVAL AND INSTALLATION OF BOTTOM GUARD (BOTTOM STUMP PAN/BELLY PAN) ON DOZERS

						
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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 installing or removing bottom guards (stump pan/belly pan) from track type dozers in a shop environment.

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

- Unexpected movement of dozer while working on machine.
 - Follow 950C-C-028 Hazardous Energy Isolation Code and ensure unit is locked out by all persons working on the machine.
 - Lower all implements.
- Crush or pinch points from stump pan moving unexpectedly during lowering or raising resulting in serious or fatal injuries.
 - Keep fingers and hands away from pinch points when removing pan bolts.
 - Ensure that when leaving nuts or bolts in place to secure stump pan that they have at least one half the thickness of the nut or bolt in the threads.
 - **Stay out from beneath the bottom stump pan once bolts or nuts are removed, and the pan is unsecured.**
 - Do not work under a suspended load; stay clear from the bottom pan when lowering or raising it. Additional precautions may need to be taken should the bottom pan not lower normally (i.e., distorted stump pan, excessive mud, or dirt). In this situation a JSA is required with supervisor review and sign off prior to work continuing.
 - Lower or raise the stump pan in a controlled manner. Use a hydraulic jack, TED or rigging to control the stump pan. Do not attempt to manually lower or raise the pan.

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- Overhead hazards such as falling debris, dirt, hardware, or tooling when under the machine. Tripping hazards from dirt, debris, and tooling.
 - Ensure proper housekeeping when working under or around the machine. Store tools properly and out of the work area when not in use. Clean floor or steel plate to remove tripping hazards.
- Crush or pinch points when moving stump pan away from or towards dozer.
 - Where possible, move the dozer not the stump pan or use TED (Tracked Elevating Device).
 - If the dozer cannot move, the stump pan may be moved using an adequately sized rolling hydraulic jack (i.e., transmission jack) providing the following conditions have been met:
 - Ground and floor conditions are clean and clear from material build up and tools.
 - Ensure stump pan is center and stable on wheeled jack prior to moving. If possible secure the stump pan to the jack with a tie down or use a large enough jack that the pan cannot tilt off. Use a non-slip surface (i.e., rubber mat) between the stump pan and wheeled jack to prevent slippage.
 - Keep jack at ground level while moving with pan to prevent the pan from falling. Jack path should be clean and clear to prevent jack from catching or stopping unexpectedly.
 - **Do not place hands, fingers, or body parts in a pinch point.** Use a “push stick” to push the wheeled jack out of the area or use a rope to pull it out. Never force the jack/stump pan to move.
- Workers unfamiliar with task.
 - Only competent trained personnel will complete the task (do not attempt to remove a bottom stump pan unless you have successfully removed one previously OR a supervisor is present).
 - **This task must be completed with two people. At least one of which must be a Heavy Equipment Technician or equivalently experienced and trained tradesperson. The SOP and corresponding JSA must be reviewed by all persons completing the task prior to conducting work.**
- Defective tooling.
 - Used approved tooling adequate for the task and ensure it is in good working order.
 - Inspect all tools and equipment prior to use.
- Equipment contact, property damage and/or personnel injury while operating Tracked Elevating Device (TED).
 - The operator will complete a visual inspection of the equipment used to remove and install bottom guard / stump pans. Follow manufacturers procedures for inspection criteria.

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- Use a spotter(s) when moving TED into position.
- Travel at slow and controlled speeds. Before moving TED into position 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.
- Heavy manual lifting and awkward body positions 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).

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 Bottom Stump Pan

Also referred to as bottom guard, stump pan or belly pan. Protects machine components from damage.

5.2 Company

Means North American Construction Group Ltd. (NACG) and all directly or indirectly owned subsidiary companies, including joint ventures.

5.3 Company Personnel

Includes the Company's employees, officers, directors, agents, associates, consultants/contractors, temporary employees, and third-party processors.

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5.4 HSE

Refers to the Health, Safety & Environment department.

5.5 TED - Tracked Elevating Device

TED is a remote controlled, battery powered, self-propelled all terrain jack designed to eliminate suspended load hazards associated with dozer stump pan removal.

6.0 PROCEDURE

This is a two (2) person task. This task must be performed by a competent person who has demonstrated the ability to complete the task safely.

6.1 General Information

- 1) Review and follow the OEM bottom pan removal procedures for specific machine model, prior to any work commencing. These can be found in the shop manuals or online in the CAT SIS system for Caterpillar dozers. Reference document number SMCS-7153. Must have copy of machine specific manual instructions attached to this SOP when reviewing this task.
- 2) Review JSA for task and complete individual 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.
- 3) Wear appropriate personal protective equipment.
- 4) Inspect all tooling and equipment prior to use. Tagout and remove from service any defective or damaged tooling, notify supervision.

6.2 Removal of Bottom Guard / Stump Pan

- 1) Set up machine to provide good access; front, rear, and sides to allow the work to be done safely.
- 2) Use suitable floor or matting etc. to allow proper use of hydraulic jack system (i.e. TED).
- 3) If machine has blade or ripper, lower ripper and or blade to the ground, access pans from rear underside of machine.
- 4) If front access is needed, raise and secure blade using blocking or stands.
- 5) Lock out machine and restrict machine access area using barricades or flagging. Follow 950C-C-028 Hazardous Energy Isolation.
- 6) Inspect hinge pins and ensure they are in good condition prior to attempting to remove them.
- 7) Caution needs to be taken and hazards assessed during the removal process to prevent injury or death:
 - o Weights of pans vary from 100 lbs. to 800 lbs.

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- Check pan for buildup of any dirt etc. and add to total weight. When doing load calculations, assume that the buildup of clay and dirt **DOUBLES** the weight of the pan.
 - Check to ensure bolts or nuts are in place and pan is secure before cleaning pan areas or climbing under machine. If bolts are missing, stop and assess hazards prior to continuing work.
 - Clean out pan areas for good access and visibility.
- 8) Position hydraulic jack (or TED (tracked elevating device)) under the stump pan assembly; ensure it is centered under the pan and the jack has a non-slip mating surface. Raise jack until it touches the stump pan. Remove cotter pins and hinge pins. Loosen nuts. Do not remove nuts. Maintain at least one half of the thickness of the nut or thread engagement on all nuts.
- 9) Begin to lower jack. If pan does not come free on its own, **STOP** and assess the situation and perform a JSA.
- 10) You may have to pry the pan away from the frame. To push the pan away from the frame, use a pry bar and work from the sides, front, or rear, or from the top through the compartment, pushing down on the pan to loosen it. Never position yourself in the line of fire while prying the pan. Some dozer bottom pans have pusher holes that use threaded bolts to push the pan away from the frame and can be used if pan does not freely drop away from the frame when lowering.
- 11) Ensure that there are no people under the bottom stump pan. Remove nuts.
- 12) Use hydraulic jack or TED to lower stump pan assembly in a controlled manner. Do not attempt to manually lower the pan.
- 13) Using TED, move stump pan from under the machine, secure the pan to TED and then move it to an appropriate area. If TED is not available, remove lockouts, start the dozer and move the machine away from the stump pan.
- a. If the machine cannot be started and TED is not available, ensure area is clear from dirt and debris and use a wheeled jack to move stump pan. Use a “push stick” or rope to push/pull jack out of congested area and avoid pinch points. Keep jack at ground level while moving with pan to prevent the pan from falling. Jack path should be clean and clear to prevent jack from catching or stopping unexpectedly.

6.3 Installation of Pan

- 1) Set up machine to provide good access; front, rear, and sides to allow the work to be done safely.
- 2) Use suitable floor or matting etc. to allow proper use of hydraulic jack system.
- 3) If machine has blade or ripper, lower ripper and or blade to the ground, access pans from rear underside of machine.
- 4) If front access is needed, raise and secure blade using blocking or stands.

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- 5) Lock out machine and restrict machine access area using barricades or flagging. Follow 950C-C-028 Hazardous Energy Isolation.
- 6) Inspect and check/install mounting hardware into the frame. Inspect stump pan, clean out dirt and debris if necessary.
- 7) When setting bottom pan on tooling jack or TED, ensure it is stable and secure. Position under machine.
- 8) **Caution:** Keep body away from pan and line of fire. Always know where people are when jacking. Good communication is needed with second person.
- 9) **Caution:** Keep jack at ground level while moving with pan into position to prevent the pan from falling. Jack path should be clean and clear to prevent jack from catching or stopping unexpectedly.
- 10) **Caution:** Recheck that pan is on jack properly and centered prior to jacking.
- 11) Slowly jack pan into position watching front, back and sides to ensure pan does not catch on other pans, etc. Once close to bolts, complete final alignment to bolts and finish jacking until against frame. When in place install nuts on the end bolts closest to you, use tooling to tighten.
- 12) **Caution:** Keep body away from line of fire when installing nuts
- 13) Once the nuts are tight you can install the remaining nuts and tighten. Do not remove jack or TED until all nuts are tight.
- 14) Install hinge pin and retainer locks.

6.4 Stump Pan Removal and Install Using TED (Tracked Elevating Device)

- 1) Set up the dozer on flat, level surface to provide good access for TED. Note: TED cannot be operated on a slope greater than 10% grade.
- 2) To activate TED, turn on the master disconnect switch and power switch. Ensure the emergency stop button is not depressed.
- 3) Unplug the charging lead if required, remove TED from the transport cradle and conduct the pre use inspection. The pre use inspection must be documented in the logbook.

NOTE: Before conducting the inspection ensure the remote-control handset is in the off position.

- 4) Follow the inspection checklist checking all the circlips on the rams and scissor pins. Ensure the pump guard is in place. Check pump, valve and travel hoses for leaks damage or dirt build up.
- 5) Raise the hydraulic cylinder and install hydraulic cylinder locks for inspection.

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- 6) Check the oil level. Remember the cylinders are extended so the level should be at the lower mark. Do not overfill.
- 7) Conduct an inspection of the working zone and travel path prior to commencing work.
- 8) Switch on remote handset and wait 3 seconds. Engage and hold the “dead man” switch until you hear TED beeping. The receiver display should indicate “System Good, Linked”. TED is now ready to operate.
- 9) Clean any dirt built up on the bottom of the stump pan and follow steps in Sections 6.2 & 6.3 for removal and installation of pan.

7.0 NOTES

Bottom guards / stump pans can become distorted over time and will not always come free when lowered. Stop and assess the hazard for these cases, taking extreme caution to ensure the load does not come free uncontrolled and that no one works under a suspended load. In this situation a JSA is required with supervisor review and sign off prior to work continuing.

Some dozer bottom guards / stump pans have pusher holes that use threaded bolts to push the pan away from the frame and can be used if pan does not freely drop away from the frame when lowering.

8.0 REFERENCES

- 960C-SOP-402 Hoisting Large Components Using Cranes, Boom Trucks
- 960C-SOP-404 Mobile Crane Operation
- 960C-SOP-004 Flagging Tagging and Barricading Hazardous Areas
- 960C-SOP-022 Dropped Object Prevention
- 960C-SOP-500 Use of Pneumatic Tools and Compressed Air
- 960C-SOP-504 Hand Tools Use
- 962C-SOP-008 Manual Lifting and Carrying Heavy Objects
- 950C-C-008 Cranes Hoists and Rigging Code
- 950C-C-028 Hazardous Energy Isolation Code
- TED - Tracked Elevating Device Operation – Training Campaign
- CAT dozer specific model manuals Reference document number SMCS-7153.
- CAT SIS electronic manuals,

9.0 APPENDICES

- No appendices