

# STANDARD OPERATING PROCEDURE

## Field Installation & Removal of Bottom Guard (Stump Pan) on Dozers

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## FIELD INSTALLATION & REMOVAL OF BOTTOM GUARD (STUMP 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 NACG Standards, Codes, and Processes nor does it replace the need to comply with required legislation. Section 8.0 references documentation that shall be reviewed before work commences.*

## 1.0 PURPOSE

- To establish a company standard to safely and effectively carry out work as it applies to the safe installation and removal of a bottom guard (stump pan) on track type dozers.

## 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

- Unknown hazards and job steps resulting in injury/death and/or property damage.
  - Supervisor and/or lead hand are responsible for selecting trained competent workers to perform the task of removing and installing bottom pans (stump pans).
  - The task of removing and installing bottom pans (stump pans) require the use of two or more workers one of which must be a heavy equipment technician (HET) or equivalently experienced or trained tradesperson. Workers involved in the task must review and sign onto each other's FLRA cards.
  - Workers are responsible to review and follow the SOP, OEM procedures and JSA's for removing and installing bottom pans (stump pans). If the worker needs to deviate from the SOP, OEM procedures or JSA it MUST be reviewed and discussed with the supervisor.
  - Workers must inspect the area and remove all debris, unnecessary tools, and parts from the immediate work area prior to the task.
- Unauthorized access to area.
  - Flagging and tagging will be used to identify the work area. Workers are responsible to ensure the flagging/tagging remain in place while the hazards are still present. Refer to 960C-SOP-004-FlaggingTagging and Barricading Hazardous Areas.
- Uncontrolled movement resulting in injury.
  - The dozer must be parked on a flat, level surface.
  - All implements must be grounded prior to starting work.

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- The dozer must be locked out/tagged out and tested prior to work.
- Employees authorized to perform work on the dozer must apply personal locks and tags. The worker must also be trained and competent in the lock out/tag out (LOTO) procedure refer to 950C-C-028 Hazardous Energy Isolation Code.
- Suspended load and potential crush points.
  - Do not work under suspended load; stay clear from the underside of the machine when lowering the pan. Additional precautions may need to be taken should the bottom pan not lower normally.
  - NOTE: If the bottom stump pan becomes stuck during the removal process STOP work immediately and contact the supervisor.
  - Loosen hardware in a front to back pattern (both sides) to ensure you are not under a suspended load and that you are removing the remaining rear bolt or nut on each side last, so there is unrestricted access out of the rear of the machine if the blade is on.
  - Keep fingers, hands, and limbs away from pinch points and line of fire hazards when removing or installing pan bolts.
  - Ensure that when leaving nuts or bolts in place they have at least one half the thickness of the nut or bolt in the threads. Stay out from beneath the bottom pans once bolts or nuts are removed.
  - Before removing the bottom pan (stump pans) conduct an inspection of the area, ensure no workers are positioned under the dozer.
- Hoisting equipment, rigging, and tooling failure resulting in personal injury and/or property damage.
  - Competent and qualified workers will conduct inspections on cranes, jacks, and/or TED, to ensure the equipment is in safe operating condition and that no worker, including the operator, is endangered when performing the task.
  - When using cranes, ensure the outriggers are utilized, fully extended, on flat level surface and proper stabilization plates/pads are used to ensure maximum stability.
  - Thoroughly inspect all tools and rigging used to install and remove bottom guard (stump pan). Check pry bars and wrenches/sockets for flaws, burrs, or defects.
  - Ensure all rigging, including shackles, hooks and slings are rated and/or exceeds the lifting capacity required for the load to be lifted.
  - Know the weights of components/part to be lifted and/or suspended, always refer to OEM procedures for component/part information.  
**NOTE:** Check for build-up of any dirt etc. which adds to total weight (assume double the pan weight for rigging and crane or jacks).

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- Use softeners over sharp edges and as needed.
- Use tagline(s) to control suspended loads.
- Poor ground conditions causing slips, trips, and falls.
  - Personnel involved in the task will assess the work area and identify slip, trip, and fall hazards. Controls must be in place prior to starting work. Refer to 960C-SOP-019-R2 Slips Trips Fall Hazard Prevention
  - Supervisor will conduct regular inspections of the work area to identify and fix uneven surfaces and poor ground conditions.
  - Ensure the work area is well illuminated prior to commencing work.
- Awkward body position and heavy lifting leading to musculoskeletal strains.
  - Stretch before task and take micro breaks as required. Work within individual body limitations.
  - Use of appropriate lifting aid and positioning devices (TED) to control unwanted movement of the bottom pan (stump pans) or items exceeding ability to control. Refer to 960C-SOP-020-R1 Selection and Use of Mechanical & Manual Lifting Aids.

## 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.
- ☐ OEM procedure must be attached to the work order for this task and a sign-off of this SOP by all personnel involved in the work.
- ☐ Standard of training required for working on this job: Heavy Equipment Technician or equivalently experienced or trained tradesperson.

## 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.

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### 5.3 HSE

- Refers to the Health, Safety & Environment department.

### 5.4 Bottom Guard

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

### 5.5 T.E.D

- 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

### 6.1 General Information

- Supervisor and workers will discuss the task and plan the safest way to approach the work.
- Workers will complete an FLRA card and identify the hazards and controls. Workers involved in the task must review and sign onto each other's FLRA cards.
- Workers must have a copy of machine specific manual instructions attached to this SOP when reviewing this task.
- This must be a 2-person task. Review and follow the OEM bottom stump pan lowering 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. Reference document number SMCS-7153.
- Wear appropriate personal protective equipment (PPE) refer to 950C-C-049 PPE - General Code.
- The dozer must be locked out/tagged out and tested prior to work, employees authorized to perform work on the dozer must apply personnel locks (green lock) and personnel tags.

### 6.2 Field Lowering of Bottom Stump Pan

- Set up the dozer on flat, level surface to provide good access (front, rear and sides).
- If machine has blade or ripper, lower ripper and or blade to the ground.
- Access pans from rear underside of machine. If front access is needed, raise and secure blade using correct blocking or stands.
- Lock out machine and restrict machine access area using flagging, tagging and/or hard barricades.
- Ensure that hinge pins are in place.
- Caution needs to be taken and hazards assessed during the lowering process to prevent injury or death:

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7. Weights of pans vary from 100 lbs. to 800 lbs., check the OEM procedures for specific weights.
8. 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.
9. 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.
10. Clean out pan areas for good access and visibility.
11. Inspect all tooling, lifting devices and rigging to ensure that it is suitable for the task.
12. Set up rigging using the OEM procedures with one end anchored to the side frame or the dozer push arm on the hinged side of bottom stump pan. Run the rigging under the center of the pan to be removed and run through the opposite frame securing to the crane or come-a-long.
13. Caution: Watch for catch points on the rigging, e.g.: sharp corners that could cut rigging or where attachment hooks could catch on pan, frame, or tracks. Using a test lift, address these concerns prior to any removal of pan mounting hardware.
14. If using a crane, ensure the outriggers are being utilized and proper stabilization plates/pads are in place to ensure maximum stability for the crane while it is in use.
15. Slowly lift and tighten the rigging to secure the pan in place.
16. Once pan is secured, start removal of hardware. Loosen nuts that secure bottom stump pan to tractor frame. Do not remove nuts. Maintain at least one half of the thickness of the nut of thread engagement on all nuts.

**NOTE:** Loosen hardware in a front to back pattern (both sides) to ensure you are not under a suspended load and that you are removing the remaining rear bolt or nut on each side last, so you have unrestricted access out from under the rear of the machine if the blade is on. If the blade is off, reverse this step and access out from under the front of the machine.

17. Ensure that there are no people under the bottom stump pan. Lower the suitable lifting device slightly and observe if the bottom stump pan is resting on the nuts.

**NOTE:** If pan does not come free on its own, STOP and assess the situation and perform a JSA. You may have to pry the pan away from the frame. You will need to do this without positioning your body anywhere under the pan. 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.

18. Once the pan is resting on nuts, remove any excess slack in the restraining device.
19. Remove nuts that are farthest away first. Remove the nuts that are closest to you last to prevent the need to reach across the loosened pan.

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20. Using the restraining device, lower the bottom stump pan until it is securely on the ground or suitable blocking to support the load.

## 6.3 Field Raising of Bottom Stump Pan

1. Assess machine and area conditions for any hazard or changes since pan was lowered, address any that are found with use of the FLRA or JSA where needed.
2. If machine has blade or ripper, lower ripper and or blade to the ground, access pans from rear underside of machine.
3. If front access is needed, raise and secure blade using correct blocking or stands.
4. Reinspect rigging and that it is attached properly to the anchor point, centered on the pan, then hooked up to suitable lifting device.
5. Take up slack and complete a test lift of rigging, prior to fully lifting pan, to ensure rigging is in place and secure. Keep body away from pan and out of line of fire.
6. Slowly raise pan towards frame, watching all sides to ensure pan does not catch on other pans, stopping at the bolts. Align the pan to the bolt holes and then slowly raise pan until it touches the frame. Once in place, install nuts on the end bolts closest to you, use tooling to tighten. Keep body away from line of fire when installing nuts.

**NOTE:** Aligning will require the use of pry bars, work from the sides, front or rear, or from the top through the compartment to align the holes. Never position yourself in the line of fire while prying/aligning holes.

7. If bolts do not line up while pan is being raised. **STOP** and assess the situation and perform a JSA to address requirements to straighten out pan. You may need to remove the pan for repair to align the pan to bolt holes. Follow SOP 960C-SOP-406 for the Shop Removal and Installation of Bottom Guard (Bottom Stump Pan/Belly Pan) on Dozers.
8. Once nuts are tight you can install the remaining nuts and tighten. Remove lifting device (reverse order step 16 - Field Lowering of Bottom Stump Pan)
9. Do not remove lifting device until all nuts are tight.
10. Keep body out from under suspended pan.

## 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.
2. To activate TED, turn on the master disconnect switch and power switch. Ensure the emergency stop button is not depressed.

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- 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.

- Follow the 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.
- Raise the hydraulic cylinder and install hydraulic cylinder locks for inspection.
- Check the oil level. Remember the cylinders are extended so the level should be at the lower mark. Do not overfill.
- Conduct an inspection of the working zone and travel path prior to commencing work.
- 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.
- Clean any dirt built up on the bottom of the stump pan and follow Field Lowering of Bottom Stump Pan & Field Raising of Bottom Stump Pan process.
- After stump pan has been loosened and ready for removal, walk TED into position under stump pan.
- Raise the platform until it contacts stump pan
- Remove bolts from stump pan, ensuring you are out of the line of fire.
- When all bolts have been removed, slowly lower the platform ensuring the stump pan comes down. After confirming the stump pan is lowering properly, fully lower the stump pan and secure stump pan to TED.
- After stump pan has been secured, TED can be walked out from under the machine.

## 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.
- Complete removal of a bottom stump pan/belly pan will not be completed in the field unless proper removal procedures, including the use of an appropriate jack, are followed and a JSA is completed or reviewed.

## 8.0 REFERENCES

- 950C-C-022 General Housekeeping Code
- 950C-C-028 Hazardous Energy Isolation Code



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- 950C-C-049 PPE - General Code
- 960C-SOP-004 Flagging Tagging Barricading Hazardous Areas
- 960C-SOP-013 3 Point Contact
- 960C-SOP-019 Slips Trips Fall Hazard Prevention
- 960C-SOP-020 Selection and Use of Mechanical & Manual Lifting Aids
- 960C-SOP-022 Dropped Object Prevention
- 960C-SOP-402 Hoisting Large Components Using Cranes, Boom Trucks
- 960C-SOP-404 Mobile Crane Operation
- 960C-SOP-406 Shop Removal and Installation of Bottom Guard (Bottom Stump Pan/Belly Pan) on Dozers
- 960C-SOP-500 Use of Pneumatic Tools and Compressed Air
- CAT dozer specific model manuals Reference document number SMCS-7153.
- CAT SIS electronic manuals

## 9.0 APPENDICES

There are no appendices.