Hastings Deering CAT

General Equipment Safety Bulletin

Technical Support Department

Bulletin 007/2012

Subject: Releasing Stored Hydraulic System Pressure before Servicing or "Opening" Systems for Repairs.

Affected Product: Caterpillar Excavators - All Models 303 to 390, 5110, 5130, and 5230, with pilot operated hydraulic systems and hydraulic accumulators.

Injury Risks identified:

- Eye injuries or skin penetration from high pressure oil jets
- Injury from items propelled by high stored pressure
- Crush injuries from cylinder or implement movement
- Burns from hot hydraulic oil

Problem Overview

Excavators and other mobile plant hydraulic systems can contain stored hydraulic pressure when the engine is not operating. This stored pressure can be as high as normal system operating pressure. Failing to safely release this pressure before servicing can lead to the injury risks highlighted above.

Be aware of the following sources of unexpected stored hydraulic pressure:

- **Improper Procedures to Release Stored Hydraulic Pressure.** Rotating the joysticks may release pilot circuit pressure before the main circuit pressure has been safely reduced in the circuit being serviced.
  DO NOT ROTATE THE JOYSTICKS. "Move only the joysticks or the pedals of the hydraulic circuit that requires service to the FULL STROKE positions in both directions. This will release the high pressure only in that hydraulic circuit. This will also release any pressure that might be present in the pilot hydraulic circuit."

- **Improperly Supported Implements.** The weight of improperly supported or secured implements may create hydraulic pressure. This may result in unexpected implement movement, or unexpected hydraulic pressure escape when fittings are being released.
- **Temperature changes.** Heat induced system pressure due to operational or ambient temperature increase will result in pressure increase due to fluid/air expansion.
- **Accumulators.** Failing to release pressure stored by hydraulic accumulators.

The sudden release of hydraulic oil under pressure can result in serious personal injuries or death

Figure 1.

Discussion

Before any Excavator hydraulic circuit line is opened for service, all hydraulic fluid resevoirs, cylinders and lines **MUST** have residual hydraulic pressures released. As it is difficult to confirm with certainty that all hydraulic pressure has been released, there is potential for high hydraulic pressure to be retained in the system unless the correct procedure is performed.

Recommended Hazard Management Action Plan

- Read and understand the appropriate sections of the Caterpillar Service Manual being serviced, prior to commencing work. This must include all Safety Warnings, and Service and Repair Procedures.
  (Note the Critical Steps on page 3 of this bulletin)

- For non-Caterpillar attachments, refer to the appropriate manufacturer's Service Manual procedures before proceeding to the next step.

- Perform a Job Hazard Analysis (JHA) prior to undertaking all complex or potentially dangerous tasks.

- Develop a written work procedure addressing hazards identified by this Job Hazard Analysis.

- Ensure appropriate supervision for task and skill level of worker is in place.

- Assume all hydraulic systems contain residual pressure until the correct steps are taken to release this pressure.

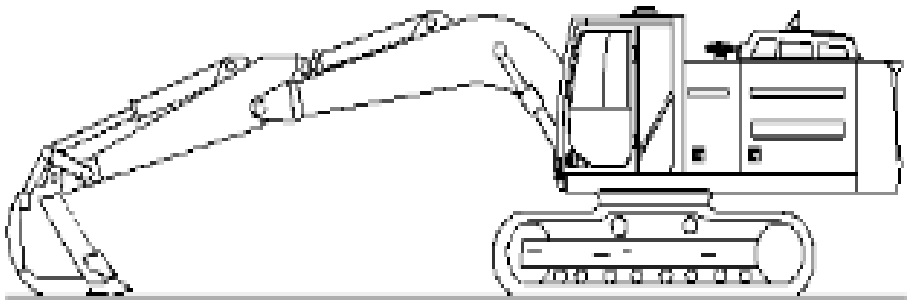

Figure 2

Critical Steps

The following steps are critical when working through Service Manual Procedures:

- The level of residual hydraulic pressure in the hydraulic system, due to component self-weight, can be minimised by fully extending the stick cylinder rod, placing the bucket level on the ground with the boom in the extended position. Refer figure 2.
- Ensure pressure in hydraulic tank is relieved as instructed in Service Manual.
- **DO NOT ROTATE THE JOYSTICKS -** Rotation will result in the stored accumulator pilot pressure depleting rapidly, preventing the release of residual pressures in individual hydraulic circuits and cylinders.
- The key point from the service manual to understand is reprinted below:

"Move only the joysticks or the pedals of the hydraulic circuit that requires service to the FULL STROKE positions. This will release the high pressure only in that hydraulic circuit. This will also release any pressure that might be present in the pilot hydraulic circuit."

Contact Details:

If further information is required in regard to this bulletin, contact your nearest Hastings Deering branch on 131 228 and ask to speak to a Service Advisor or your Product Support Representative.

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