



Mines Safety Significant Incident Report No. 168

Pressure release blows blanking plate off dozer tilt cylinder

Summary of incident

A blanking plate blew off a dozer tilt cylinder that was being replaced by a fitter. The fitter had removed the four bolts clamping the blanking plate without first releasing the cylinder's internal pressure. The blanking plate, bolts and retaining collar blew off under pressure, lacerating and abrading the fitter's hands, which required surgery.

Probable causes

The tilt cylinder involved in the incident has blanking plates fitted at each end to prevent the ingress of dirt before the cylinder is fitted to the dozer (Figure 1).



Figure 1 Location of blanking plates on tilt cylinder. Photograph courtesy of Liebherr

Contributory factors to the incident are listed below.

- The temperature within the supplier's factory is commonly much lower than that experienced onsite, where the cylinder may be placed in a holding yard and subject to the elements.
- Testing is undertaken at the supplier's factory and the cylinders, as supplied, contain residual fluids.
- Onsite, oil and air contained within the cylinder expand in the higher temperatures, increasing the internal pressure.
- The service manual provided by the original equipment manufacturer (OEM) warns of the possibility of a pressure increase within the cylinders and the need to loosen the blanking plate bolts before removing the blanking plate. In this incident, however, the warning was not heeded and the pressure was not vented before the blanking plate was removed.

Action required

The company involved with this incident has notified the OEM and other manufacturers of this danger, with many having already identified the hazard. Some have installed bleed screws as a standard fitting.

To avoid a recurrence of this type of incident for tilt and other sealed cylinders, management must ensure:

- maintenance personnel
 - follow the OEM service requirements and release any pressure build up within the cylinder in a controlled manner

- are appropriately trained and competent to carry out the task
- are supplied with and use appropriate personal protective equipment (PPE); and
- where possible, warning labels are fitted to cylinders advising of the potential hazard.

A handwritten signature in black ink, appearing to read 'S. Ridge'.

Simon Ridge

STATE MINING ENGINEER

10 January 2011