

Cylinder Assembly Bench Roller

Hastings Deering (Australia) Limited

Hastings Deering's Expanded Mining Products facility in Mackay includes a workshop equipped for repairs and rebuilds of hydraulic cylinders used with underground and large mining equipment.

A custom-built assembly bench is used for the cylinder rebuilding (see figure 1). It comprises of a beam, a series of sliding roller assemblies (see figure 2 lower below) and fixed v-blocks.



Figure 1 — Cylinder assembly bench general layout: original roller assemblies shown.

Following an internal risk assessment of the cylinder assembly process, it was identified that the inner rod of a cylinder on the bench could fall if subjected to a side load during the rebuild process.

The weight of the inner rods (each up to 3 tonnes) and the close proximity of service personnel meant that the consequence of a fall escalated risk to an unacceptably high level.

The roller assemblies were also removed and replaced up to 12 times per day, so a method of attachment and removal had to be developed that was as efficient and ergonomic as possible.

Hastings Deering's Engineering Services team devised a design for the roller assemblies that would prevent cylinders falling from the bench and address the identified ergonomic constraints.

Some alternative solutions were originally considered, but these were rejected due to inefficiency or weight. The preferred solution to improve worker safety was a new cylinder assembly bench roller design. The design included a self-closing and locking mechanism that could be released easily by the bench operator to remove the roller assembly from the bench.



Figure 2 — New roller assembly design showing mechanism in open and closed state.