

GET Removal Tool

MMG - Century Mine

The Problem or Initiative

The change-out of the GET (Ground Engaging Tool) on Liebherr 996 shovels at MMG Century, as at other mine sites, presented a number high safety risks due to the equipment's size and weight.

The first high risk factor was that the current process required tradespeople to manually handle the GET from the bucket. The second high risk factor was that the lugs had to be welded to the GET to enable it to be removed from the Liebherr bucket. While lifting lugs are incorporated into the design of the GET, they detach from wear during operation.

As a lifting tool to assist with the safe change-out of GETs was not available, Century's Mine Maintenance Workshop (MMW) undertook a project to develop such a tool.

The Solution

The MMW boilermaker team worked with Century's engineering department to develop a lifting tool to safely and efficiently remove the GET from Liebherr buckets.

During the design phase, the aim of the team was to develop a device – the GET Removal Tool – to remove GETs that:

- Eliminated the need to manually handle the GET; and
- Eliminated the need for another lifting lug to be welded onto GET for removal.

The device is used by:

A prototype (see Figure 1) was then developed based on these requirements, with the site's engineering department certifying that the device was safe for use before it entered service as a trial. This process confirmed that the tool met stringent load-testing requirements and was certified with a working load limit of 100 kilograms.

Safe Work Instructions (SWIs) and other operation instructions were also developed and personnel trained in the GET Removal Tool's use before it was entered into service, in accordance with Century's strict safety and health standards.

Once in trial, the diesel fitters using the GET Removal Tool were asked for their feedback about its effectiveness and put forward suggestions to improve the device. Feedback has been extremely positive, with no recommendations put forward to further improve the tool. Following the completion of the trial, the tool is now used whenever a GET is change-out on a Liebherr shovel.

There is no alternative to removing the GETs from the shovel. Therefore, while the process cannot be eliminated or substituted – the first two solutions on the Hierarchy of Controls – an engineering control has been developed to address risks associated with changing-out GETS.

It should also be noted that the serious risks associated with needing to manually handle and weld a lifting lug to the GET have been completely eliminated by the development of the GET Removal Tool.

Benefits / Effects / Outcomes

The safety benefits associated with the GET Removal Tool include:

- Risks associated hot work (welding) have been eliminated as this is no longer required; and
- Muscle strains, pinched and crushed fingers and other injuries resulting from manual handling the GET have been eliminated.

Other benefits have included:

- Downtime and labour required to service Liebherr buckets has decreased as a lifting lug is no longer required to be welded to the worn GET for removal. Therefore removing the boiler maker from the task, reducing labour from three trades people to two (Crane operator & Rigger);
- Costs have reduced; and Machine availability has improved as downtime associated with these change-outs has reduced, as the welding procedure is a lengthy task.

Transferability

This tool is easily transferable to other mining operations as the due diligence process has been followed. Engineering drawings, certification, operating procedures and training material are available to enable such a transfer.

As a result, the GET Removal Tool can be easily produced at other mine sites. The GET tool can now also be resized to suit other machines currently using the Esco posilok GET system.

Innovation

The GET Removal Tool is the first of its kind, as a similar device had never previously been developed for commercial use.

The manufacturers of GET Removal Tool have produced a product with a moulded lifting lug for fitment but no tooling for removal at end of life.

It was also designed to improve the productivity levels of the mine by reducing the downtime of the machine, thereby increasing equipment availability.

The introduction of this tool has also reduced costs associated with the process by removing the need for hot work and reducing the number of staff previously involved with this task.

The GET removal tool is simply attached to the worn tooth, a lifting device attached to the tooling (e.g. Crane or VLC) and then the tooth is removed from the bucket adaptor and placed straight into the service vehicle.



Figure One: GET Removal Tool

