

## 2018 Queensland Mining Industry Health and Safety Conference

### Safety Innovation Award Application

**Company:** Peabody Energy

**Site:** Wilkie Creek Mine

**Innovation:** Pin Inserting Tool

**Presenters:** Jeff Dean – Maintenance Fitter.

#### The Problem

Current workplaces where manual handling tasks are carried out are often fought with higher level of injuries mainly due to the works undertaken with the use of hands.

According to the Australian Statistics, WorkCover QLD, SafeWork NSW, we see hand injuries attribute on an average, approx. 30% of injuries.

Recently Wilkie Creek Mine sustained a hand / finger crush injury whilst the employee was fitting a large heavy blade pin into its keeper, this resulted in the Index finger and surrounding fingers suffering cuts and abrasions.

This was the third hand injury in as many weeks caused by people inserting pins into dozers. Typically the injury occurred when the pin 'slipped in' quicker and easier than the worker anticipated, pinching the individuals finger.

As we examined the incident it was obvious that though most of the hand / crush incidents sustained across the Peabody platform people had worn gloves, this did not stop an injury.

It was also obvious the use of gloves, irrespective of the type, was a lower order control in the hierarchy of control and not effective at preventing this type of injury.



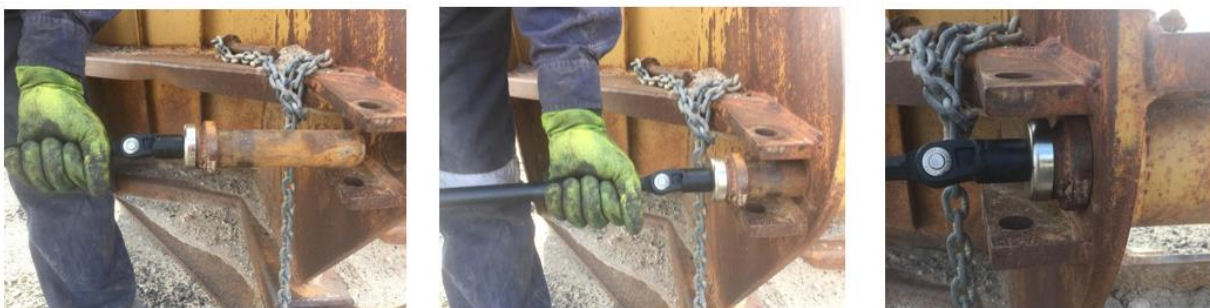
## The Solution

The types of injuries are caused by the hand being in the line of fire. There were only two real options

1. Remove the hand completely from the task. (Eliminate the risk)
2. Reduce the time and area the hand / fingers need to be where crush injuries may be present. (Reduce the likelihood).
3. Get people to wear thicker gloves (reduce the consequence).

Ideally we wanted to eliminate the risk by getting the hand out of the line. We needed something to “hold” the pin without creating “additional” weight, mechanical grabs would through their build and process add weight and length (leverage = weight).

A magnet was suggested as a possible solution. By securing a magnet that could sustain the weight and release when required was trialled, this was attached to a simple bar system we could hold the pin and place at the entry of the keeper, remove the hand from the danger zone and using the bar to continue the positioning and insert the pin.



**Benefits/Effects**

Hands are taken out of the line of fire, eliminating the risk of hand injury.

**Transferability**

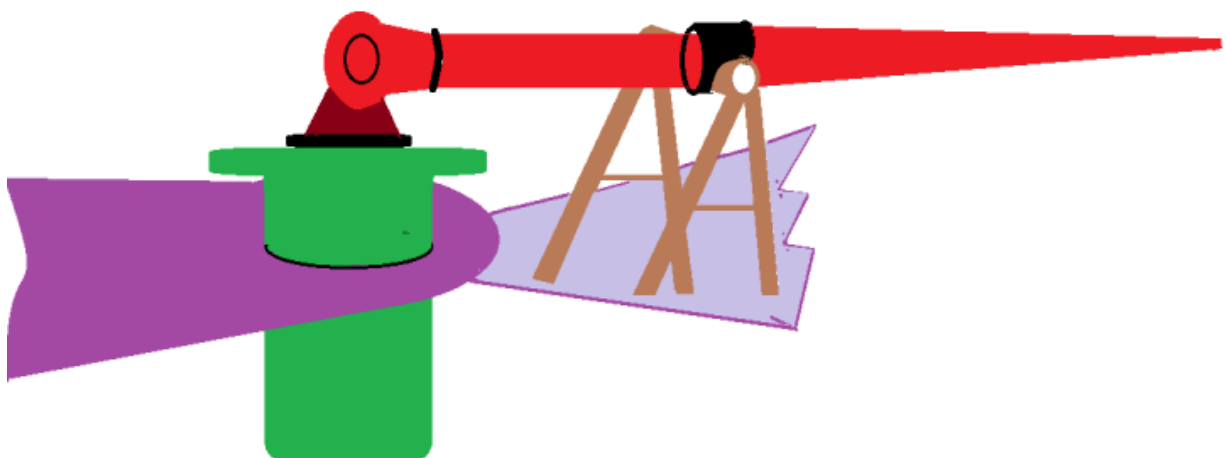
This tool can be used in any workshop or maintenance activity where pins need to be inserted.

**Innovation and Originality**

The innovation was designed and developed by workshop personnel. It is a simple solution to something that causes a lot of hand injuries. Our hands are precious, some hand injuries caused by doing this task have taken a long time to repair; particularly where tendons have damaged requiring micro-surgery.

We are continuing to review the units operations and refine as we go, We are also investigating the option of creating a cradle system where it can be used by a single operator to lower vertical pins when the process requires a person to sight from another angle, need to “wriggle” where hands and or fingers are exposed etc.

We are also experimenting with larger magnets to accommodate larger pins with electromagnets giving us the ability to be able to separate the magnet and device (due to the increased magnetism).



## Approximate Costs

To design, we used a 450mm Pry bar with an Indexable “swivel” head (cost \$80.00) and attached a Neodymium Pot magnet (cost \$91.00) with a pulling force of 112kg, There was also an additional 1 hrs labour (\$85.00) for modification to the head for connection of the magnet = Total cost of \$256.00.

By using this type of bar it will allow the other end to be used as was designed to help in the removal of the pin from its position and allow a “chock” to be inserted between the pin and keeper to prevent crush should the pin slip back into position.

A simple design like this will mean there is very limited additional weight added when lifting the pin, hands will only be need at the start of the process for initial line up then can be removed from crush / pinch areas and pins not needing to be pressed and or driven can be inserted safely.

The pin in the photos is just shy of 2kg, the pin in which the fitter sustained the injury was 3.8kg, the tool can handle the larger pin but we have another stronger magnet coming to create a greater safety factor.

Neodymium Pot - Countersunk 60mm x 15mm



Product Code:	AMFYPA60
Pull Force:	112 kg
Direction of Magnetisation:	Axially magnetised thru the 15mm
Coating:	Nickel (NiCuNi)
Weight:	252 gm
Style:	Rare earth countersunk pot magnet

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