



## **CLESHAR.**

### **Prevention of Musculoskeletal and Hand Injury (Crush Injury)**

#### **The Rail Grip**

##### **Background**

A recent report from The Work Foundation found that musculoskeletal disorders (MSDs), a group of over 200 conditions including arthritis, back pain and damage to joints, muscles and tendons are by far the most common cause of work-related illness in the UK. MSDs account for up to one third of all "GP" consultations, result in 9.5 million lost working days, and currently cost society approximately £7.4 billion a year.

Dame Professor Carol Black, national director for health and work said: "I hope that in time MSDs will become less relevant to work and working life. Until then, efforts to raise awareness of them must continue with ever greater urgency.

The Health and Safety Laboratory (HSL 2006) undertook a piece of research "Manual Handling in the Rail Sector South Wales" involving the railway industry which demonstrated that handling related injuries in the rail sector constituted approximately 22% of the total injuries reported to HSE for the sector. Strain injuries were said to be the main injury type, accounting for nearly 58% of the total. The three most frequent injuries were: strain of the back; laceration of the fingers; and fracture of the fingers. Fracture is the second most common injury, perhaps as the research suggested a further indication of the heavy nature of the manual handling in the rail industry. Of the strain injuries, two thirds were to the back. The research further suggested that it is notable that, for the heavy handling associated with the track and depot working, the manual handling injuries are not confined to back strains. Although this is the most commonly occurring injury type, there were a high proportion of fractures and crushing/trapping injuries to the hands and feet.

##### **About Cleshar Contract Services Ltd**

With more than 1,200 trained and experienced operatives and a fleet of 250 vehicles, Cleshar ([www.cleshar.co.uk](http://www.cleshar.co.uk)) delivers a comprehensive track maintenance service.

Site resources are supported by highly experienced and skilled professionals who specialise in the complexities of working within the railway environment. They manage, scope, programme and plan all types of track maintenance and renewals activities.

Recognising the critical need to provide competent and trained operatives to maintain the railway infrastructure, Cleshar invested in the construction of a full scale tunnel section at their North London Depot. This section includes track, tunnel and platform and is used to simulate on-site conditions to provide safety, skills and competency training. Before gaining experience in a live environment, our operatives are trained in a simulated setting before being permitted on site.**Introduction**

Over recent years, Cleshar have experienced a number of injuries in relation to fingers being pinched during the handling of scrap rail. The workers lift scrap rail from the ground on to the platform and then to a flatbed truck. Fingers were trapped and there was the potential for

other injuries including musculoskeletal injury from such manual handling activities.

The recent injuries and potential for manual handling injury resulted in a discussion on how to keep fingers away from the rail and therefore minimize the risk of injury. The Rail Grip has therefore been developed to try and address this issue.

### **Work Incidents:**

- Rail slipped when being lifted and caught operatives finger between rail and trolley;
- Glove caught on cut end of rail and finger pinched between rail and platform;
- Trapped finger when lifting scrap rail to platform;
- Broken finger between 2 sections of rail when loading scrap rail onto lorry; and
- Trapped finger when fell over carrying rail.

The Company's primary objective was based on safety grounds - to reduce or eliminate the injuries that were occurring. There are costs associated with injuries in terms of operatives' time off work and compensation, and with an accident such as the resources and time spent on investigations. These are additional benefits arising from a reduction in injuries but the driving force behind the development of the kit was to stop operatives getting injured in the first place.

### **Existing Lifting Tools**

Other lifting tools were available to Cleshar which were useful in certain types of work but they did not meet the all needs for rail lifting work.

Rail Nips - existing 2 person tool for longer rail but difficult to lift up to platform level.

Plumbers bags method suggested in method statement for carrying rail but requires rails to be lifted in and out by hand which is where injuries have occurred.

Overhand grip lifting all rails by and holding the head of the rail with an overhand grip. Hands become tired quickly and risk of dropped rails.

Battery lifter - simple, quick and not long handled but as dependent on the rail weight could cause the rail to drop.

The HSL (2006) research recommended that a comprehensive review of the design of these lifting tools be undertaken to improve usability through incorporating ergonomics principles with the aim of optimising lifting and carrying postures, and spacing and orientation of workers in teams for the range of tasks for which they are used, including lifting, carrying and dragging.

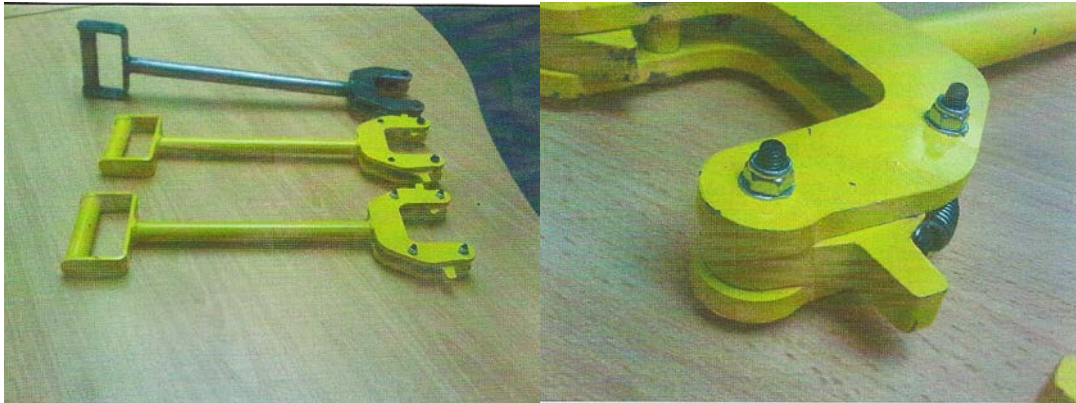
### **Design**

When Cleshar first discussed the idea of a rail grip the following were identified as the parameters:

- Must be capable of lifting rail of at least 25kg each;
- Must be simple and quick to use;
- Must be capable of locking to stop it coming loose and dropping the rail;
- Must be robust to prevent failure due to rough handling;

- Must not add much to the weight of the rail; and
- Needs to be not too much above the rail as needs to lift up to the platform from the track.

A few sketches of ideas were sent to a tool manufacturer – Innovations, who firstly prepared drawings, then a prototype. The rail grip is manufactured without moving parts other than spring loaded teeth in the jaw. It is held by a D handle and pushed down over the head of the rail. The teeth open and close around the head and do not release. The rail can be lifted by the handle and raised to whatever height is required. Once on the landing area the rail grip has to be slid off the end of the rail.



### **Prototype rail grip**

In receiving the prototype it was felt that the handle was too long and that the rail grip could be deployed on a longer piece of rail and it would take time to run it to the end. The teeth need a mechanism to allow release.

The jaw of the rail grip is able to hold both flat bottom and bull head rail but currently is not wide enough to hold various types of conductor rail.

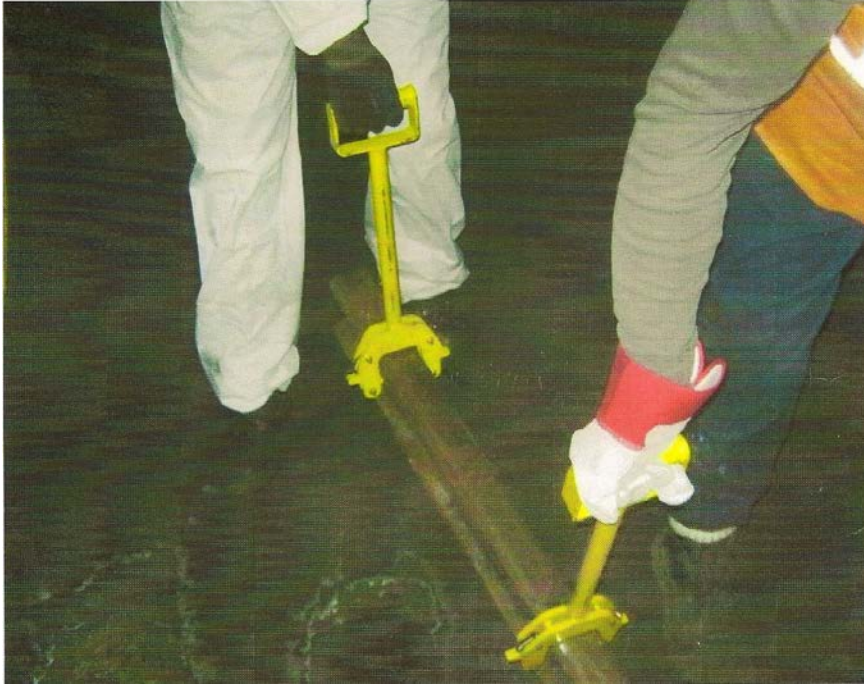
### **Trialling of the Rail Grip**

Version 1 was trialled at Cleshar facilities and test/tunnel track environment and therefore was being used in controlled area away from live track. This was undertaken in June.

Following feedback from the operatives using the rail grip we carried some adjustments to the prototype. This included:

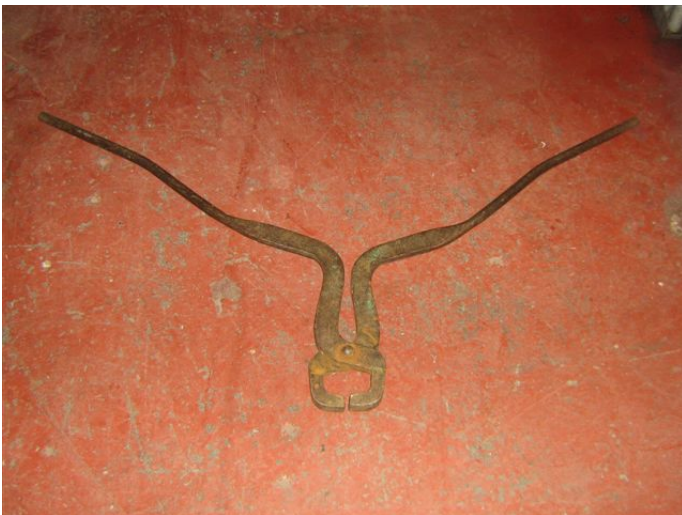
- A shortened shaft; and
- Changed orientation of the handle;

Cleshar first trialled version 2 on a site at Seven Sisters Station. They had a gang of 12 workers removing scrap rail which was cut into 1m lengths. The rail had to be moved from a storage area which had a restricted opening on to the track in a tunnel section. Representatives from Transport for London and Tube Lines health and safety departments were in attendance.



**Rail grip being trialled.**

The trial went very well with all operatives having a chance to use the rail grip and see what they thought. They all thought the rail grip was better than the rail dogs because when using the rail dog you need a man each side of the rail, holding the rail dog. 2 rail dogs were need for each section of rail, therefore 4 operatives are required. In addition, there can be problems with 4 operatives in close proximity around a short section of rail.



**The rail dog.**

Using the rail grip, that requires only one person, reduces the number of operatives needed to move a similar cut section of rail.

#### **Future Developments**

From the trials it was noted that there was a small issue when picking up the rail due to

metal on metal which can result in the rail slipping; this has been eliminated by putting a rubber strip in the top of the jaw in version 3 which is now under trial. Version 3 has also had adjustments to the jaw of the grip to see whether we can accommodate both conductor and running rail with the same piece of equipment. Trials on this version are just getting underway. Once we have the initial feedback we will be liaising with our clients on the results and deciding on the final version that we wish to implement and gain plant approval to use.

The scrap rail grip continues to be developed by Cleshar. The plan for the future is that it will be further developed still to adapt the size for the conductor rail.