

Head Wash Repair Process

Welding

Adding Value

The HWR process has been adding value to rail networks in the USA and Canada since 2008, in the UK since 2013 and in France since 2015.



Pandrol's head wash repair (HWR) process provides a cost-effective, efficient alternative to plug rail repairs.

Suitable for repairing railhead defects between 25mm and 90mm wide and 25mm deep (depending on the rail profile), it can be used on both the parent rail and on electric flash butt welds, which often suffer from squats. It is also suitable for transversal defects, shelling and corner gauge.

The aluminothermic weld process is carried out using specially designed moulds. After unmoulding, the weld is trimmed and ground in accordance with the network specifications. The HWR process complies with the requirements of all modern railway networks.

→ TECHNICAL FEATURES

Cutting and grinding

As part of the HWR process, the slot can be created by oxy-propane cutting or by grinding.

Fusion

The fusion area width is about 120mm with the oxy-propane cutting method and 80mm with the grinding method. The fusion depth reaches 30mm below the slot, ensuring total removal of the defect.

Tensile stress

Using the HWR process, the region of highest tensile stress is in the radius under the railhead. The use of HWR avoids flashing in this critical location and greatly strengthens the fatigue resistance.

Hardware

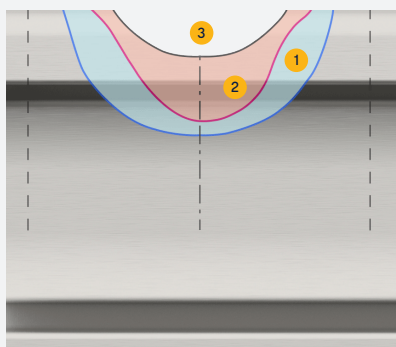
Standard hardware and a one-shot crucible is used. Specially designed moulds are based on products that welding crews are already familiar with.

Flexibility of use

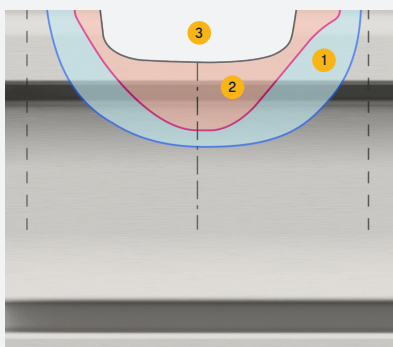
The HWR process can be used to repair squats, transversal defects, shelling and corner gauge; defects between 25mm and 90mm wide and 25mm deep; and on the parent rail and electric flash butt welds.

→ ADVANTAGES

- The head wash repair process is simple and efficient. Whereas plug rail repairs involve replacing the rail section and doing two new welds, HWR causes no rail destressing and only involves one weld.
- This results in significant savings in money and time (HWR takes around one hour, rather than three to four to put in a piece of rail).
- The HWR process is very safe, using the same welding parameters and hardware as Pandrol's welding process.
- No investment is required in training or hardware, as the HWR process uses standard hardware and one-shot crucible. The familiar mould design enables the welding crew to do the repair weld quickly and easily.
- HWR is available for all rail grades and complies with the requirements of modern railway networks.



Oxy-propane cutting method



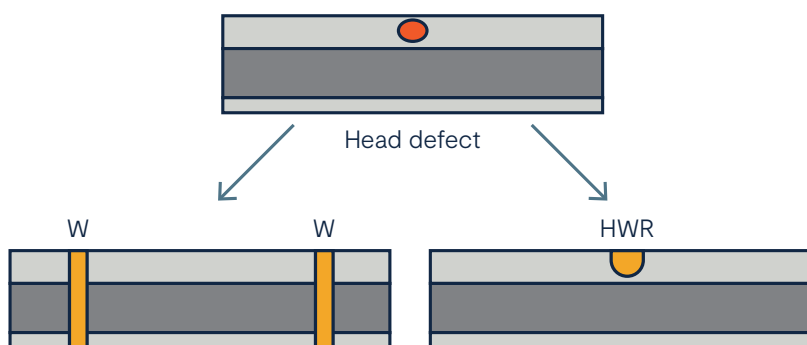
Grinding method

→ PROCESSES

1. Head-affected zone (in blue)
2. Fusion zone (in pink)
3. Excavation – filling slot (the gap).

→ COMPARISON

Comparison of plug rail and head wash repairs

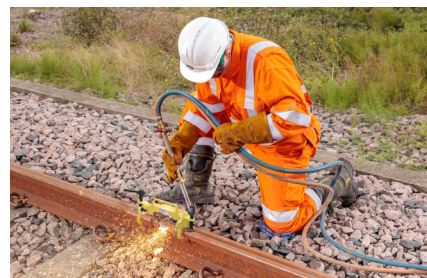


- 2 welds
- 1 rail plug

- No rail plug
- Quick installation (~1h)
- No rail destressing
- Minimal manpower

**Significant reduction
in maintenance costs**

→ PROCESS OVERVIEW



Oxy-propane cutting with gas cutting tools.



Grinding with head wash grinder.

→ LEARN MORE



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