



**Point Machines - Product Overview**



# SIL-4 Face Lock Trailable Point Machines - Overview

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The point machine is normally mounted in the 'four foot' although with special arrangements can be mounted in the 'six foot'. It is equipped with an internal mechanical locking system, complete with a facing point lock therefore common external locking systems are no longer required. Point Detection is achieved with independent point blade detection using via dual micro switches for each point blade.

Due to its short height, the point machine can be fitted without adaptation to existing track system and no additional drilling is required. The machine mounted in this arrangement has the added benefit of increasing on-site safety by reducing trip hazards in the walking route.

With conventional point machines the rail moves with the weight of each axle passing over the turnout, which overtime creates opposing forces on a point machine leading to mechanical failure. The mounting arrangements the Fenix Machine enable the machine to perform in unison to the track when train movements are present such that the machine becomes mechanically part of the rail system as mounting bars tie the machine to the rail rather than the sleeper, therefore ensures proper track alignment and reduces the strain on the points.

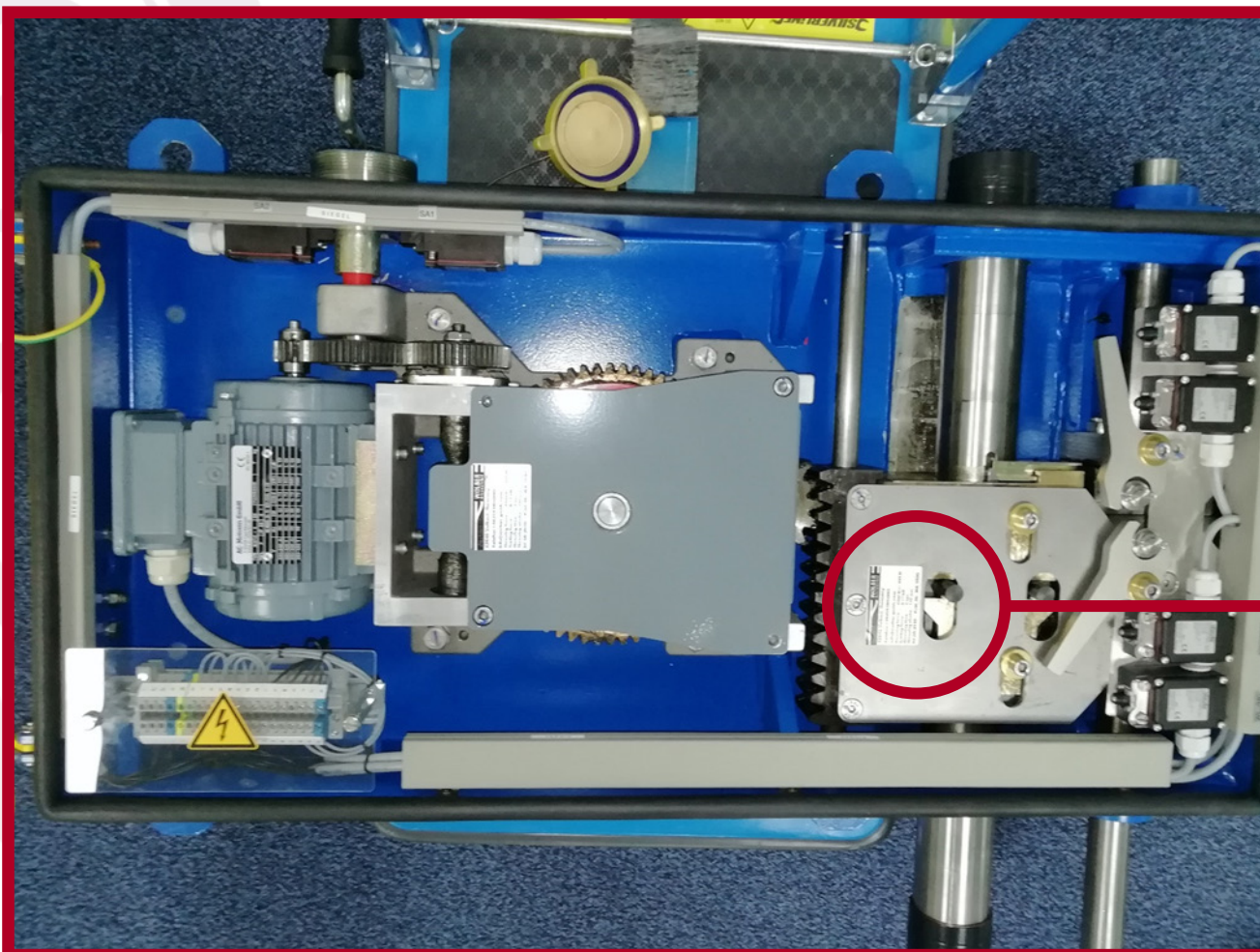
The point machine has a robust and compact construction and is suitable for both passenger and heavy freight rail traffic.



Four Foot Mounted  
Point Machine

# Fenix trailable point machine system (SIL-4)

1. Fenix's point machine is equipped with an internal mechanical locking system, therefore common external maintenance locking systems are no longer required.
2. Due to its short height, the point machine is installable between the rails without adaptation to existing track system, increasing on-site safety by reducing trip hazards.
3. The mounting brackets ensures proper track conditions and reduces the strain on the points.



Mechanical  
Interlocking

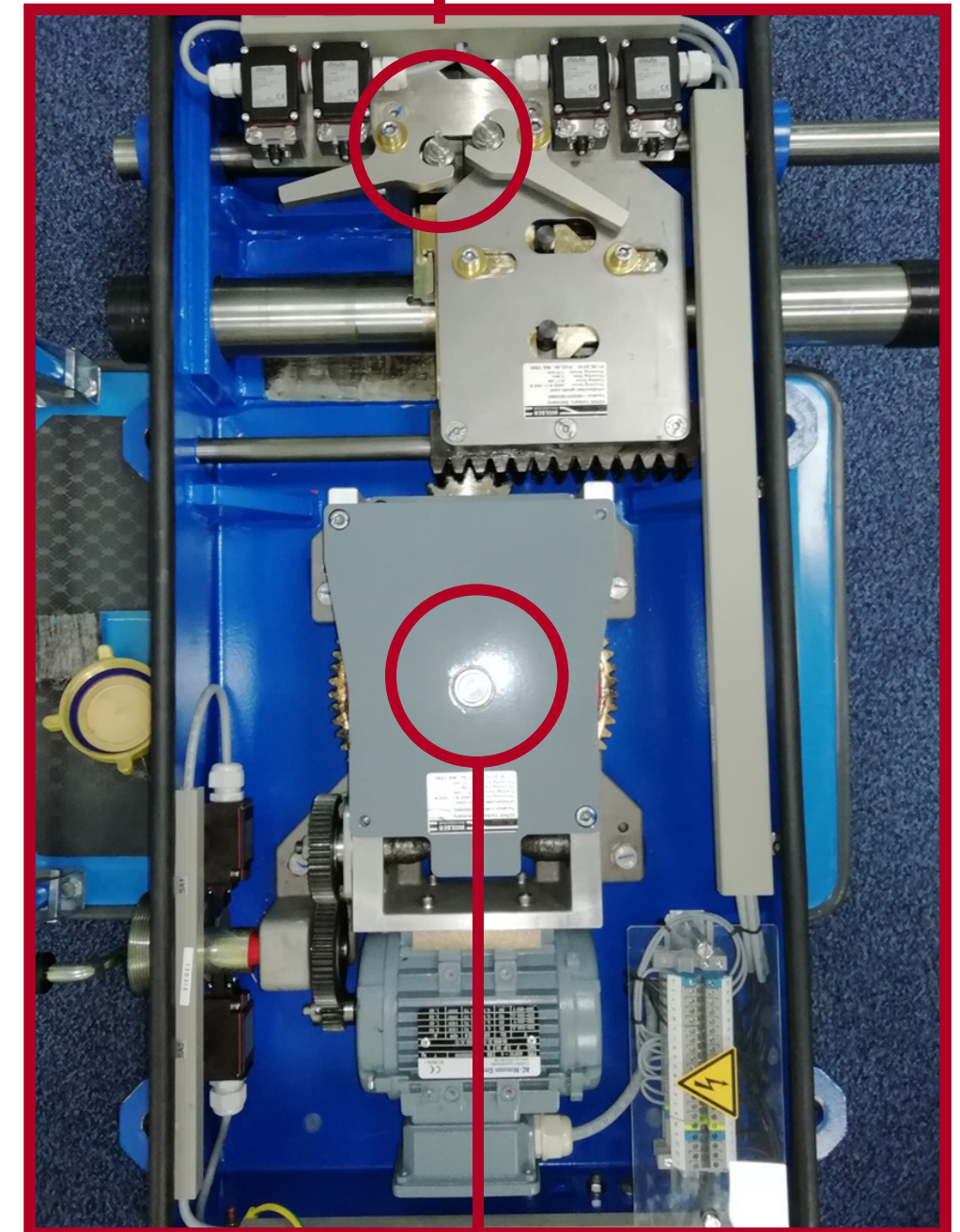


# Fenix trailable point machine system (SIL-4)

The point machine has a robust and compact construction which is perfectly suited to either passenger or heavy freight rail traffic.

- a. Facing point lock
- b. Trailable and non-trailable versions available;
- c. Independent blade detection
- d. Highly robust, reliable and easy to maintain;
- e. Internal mechanical locking system;
- f. Modular construction;
- g. Available with various throw strokes, throw times and throw forces;
- h. Various power supply options available;
- i. Compatible interface to existing controls and systems.

Point Detection

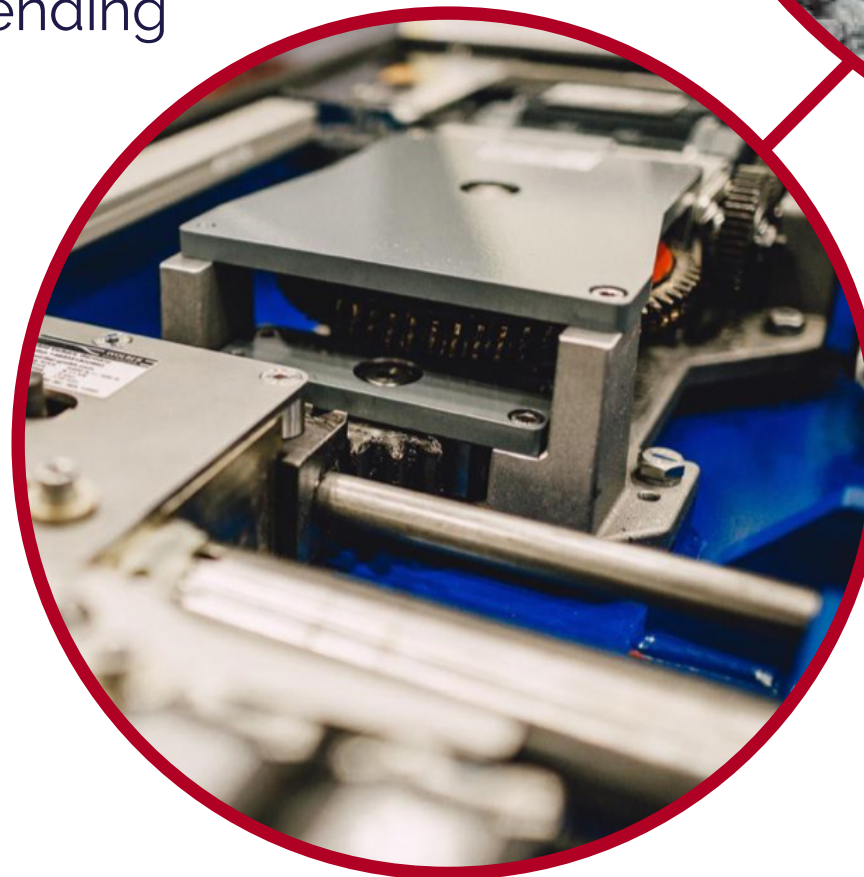


Point Drive



# Fenix trailable point machine system (SIL-4)

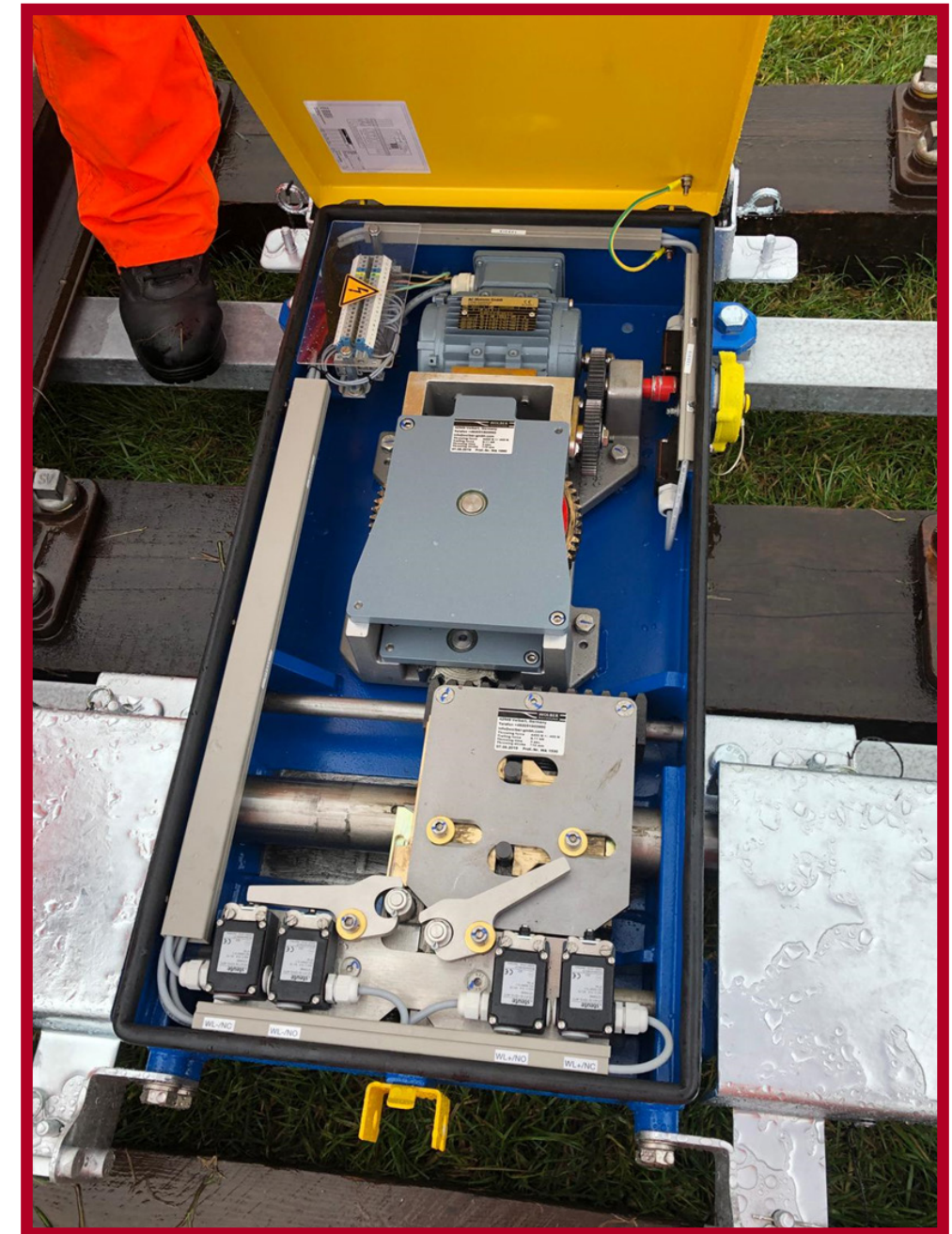
1. Low-maintenance trailable point machines which are robust and mounted in the four foot.
2. The machine can be installed in approximately 80 minutes and tested and commissioned in under two hours, saving considerable time and cost on site compared to rival machines.
3. It is mounted on two cross members which clamp to the outside foot of the stock rail and the overall height of the machine is below the standard BS113 rail running height.
4. A six-foot mounted version is also available, depending on client requirements/site layout restrictions.





# Fenix trailable point machine system (SIL-4)

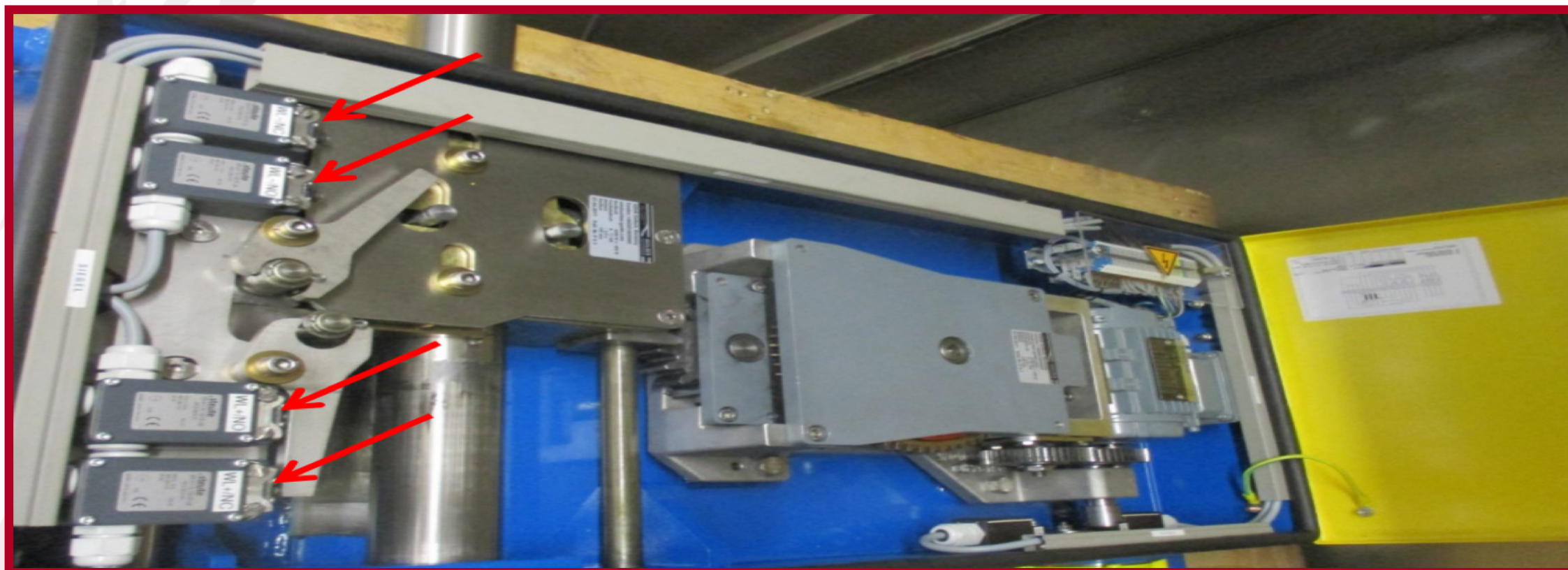
1. The detection and power are supplied by a single 4 core cable and a three-phase 400V AC supply, although a 110V DC variant is also available  
The point machine have two variants either three-phase 400V AC or 110V-120V DC power supply. The detection and power are supplied by a single 4 core cable.
2. The points machine features an internal mechanism allowing the machine to be safely used in a trailing direction without damaging the components. The machine can be installed with a plate which allows the integration of a standard six-foot mounted back drive.
3. In the event of a power failure, the machine can be operated manually by inserting a key to engage manual operation and then turning a crank handle.
4. Fitted to all rail types and profiles with various throw times available.





# Fenix trailable point machine system (SIL-4)

1. The machine requires minimal maintenance at an interval of every 6 months, which is limited to the exterior of the machine together with checking the adjustment of the detection rods.
2. If an over-running and/or a trailing move is detected, the internal interlocking automatically reverts to the non-trailing position to prevent damage to the infrastructure/train.
3. The machine is driven by an electric motor which is geared down to drive the switch blades by two rods. The rods feature a spring mechanism to prevent breaking when the machine is trailed. The detection is achieved by four micro switches attached to two detection rods (refer to photo below).



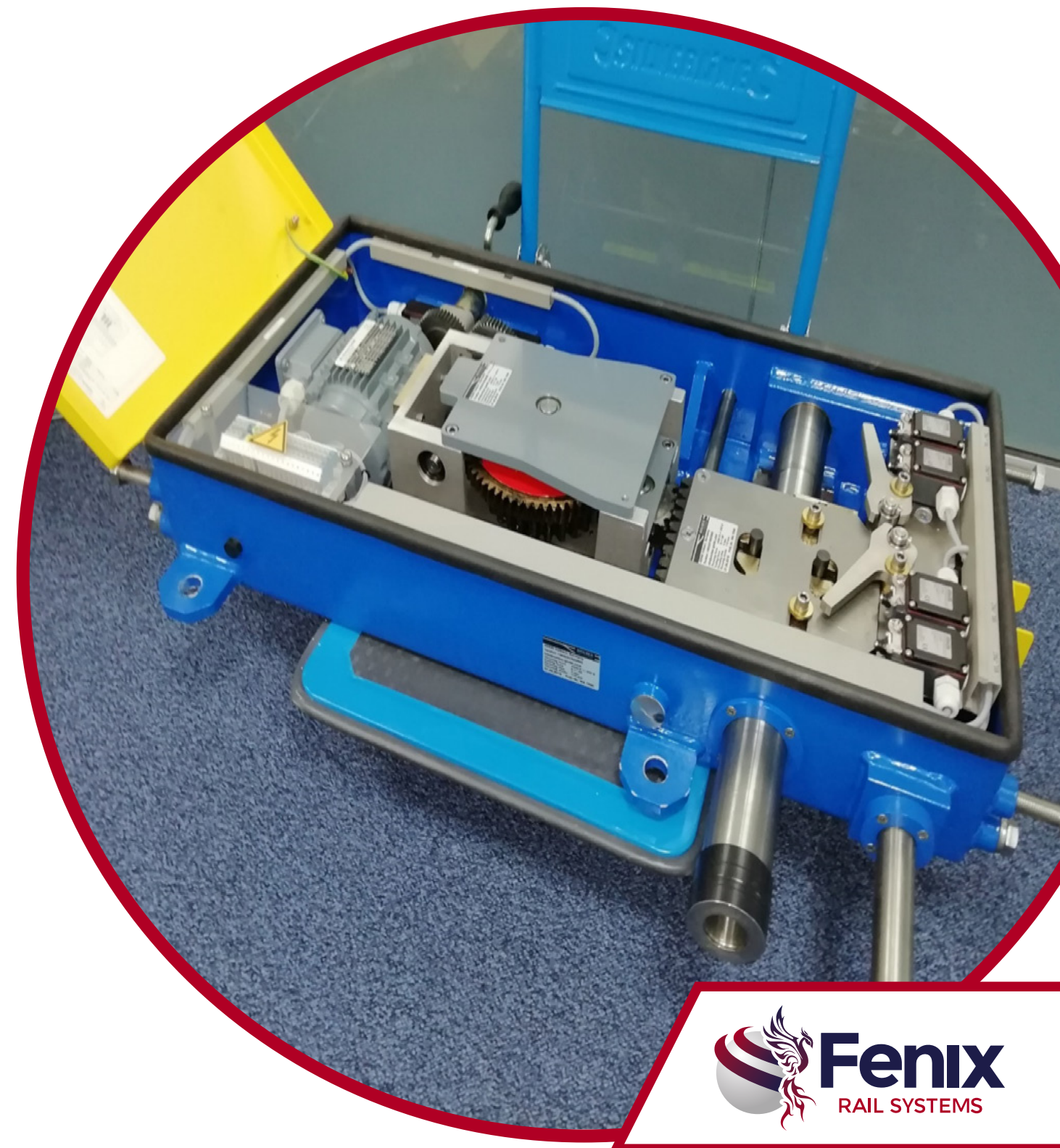


# Fenix trailable point machine system (SIL-4)

There is a 4-core cable which is terminated on L1,L2,L3 and N - this cable has two functions.

Whichever power supply chosen to drive the machine the 4 core Cable not only powers the machines motor, which in turn moves the point blades. Once the switch blade has reached its end position, the micro switches operate which cut the drive power to the machine.

The same cable is used to detect and continually monitor the point position via the same cores via the 24Vdc supply through the detection switches. This reduces the amount of cabling required throughout the site reducing cost and helping protect the environment.





# Resilience - Proven to withstand dust ingress

1. Undergoing testing for dust ingress in a laboratory environment (before above).
2. Still able to function after being subjected to testing for dust ingress (right).

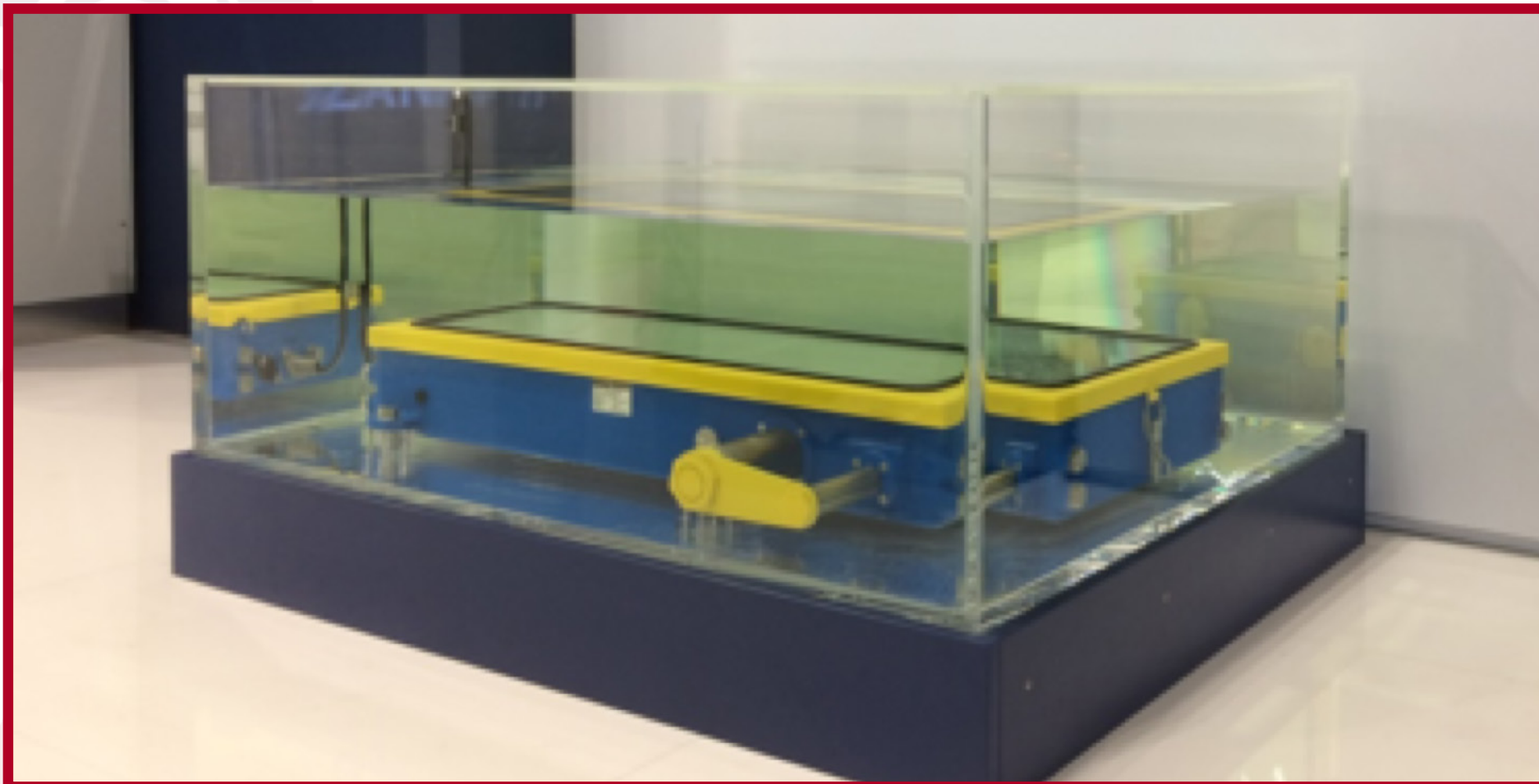


# Resilience - Water (Ingress Protection (IP) 67 accredited)

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1. Certified IP67 - Tested to work fully immersed under 1.0m of water (above).
2. Proven to work whilst withstanding a high pressure water jet as part of IP66 testing (right).

**Ideal for use in floodplains, harbours, ports, lines running adjacent to watercourse, estuaries and similar environments.**





# Resilience – functioning in the most challenging conditions

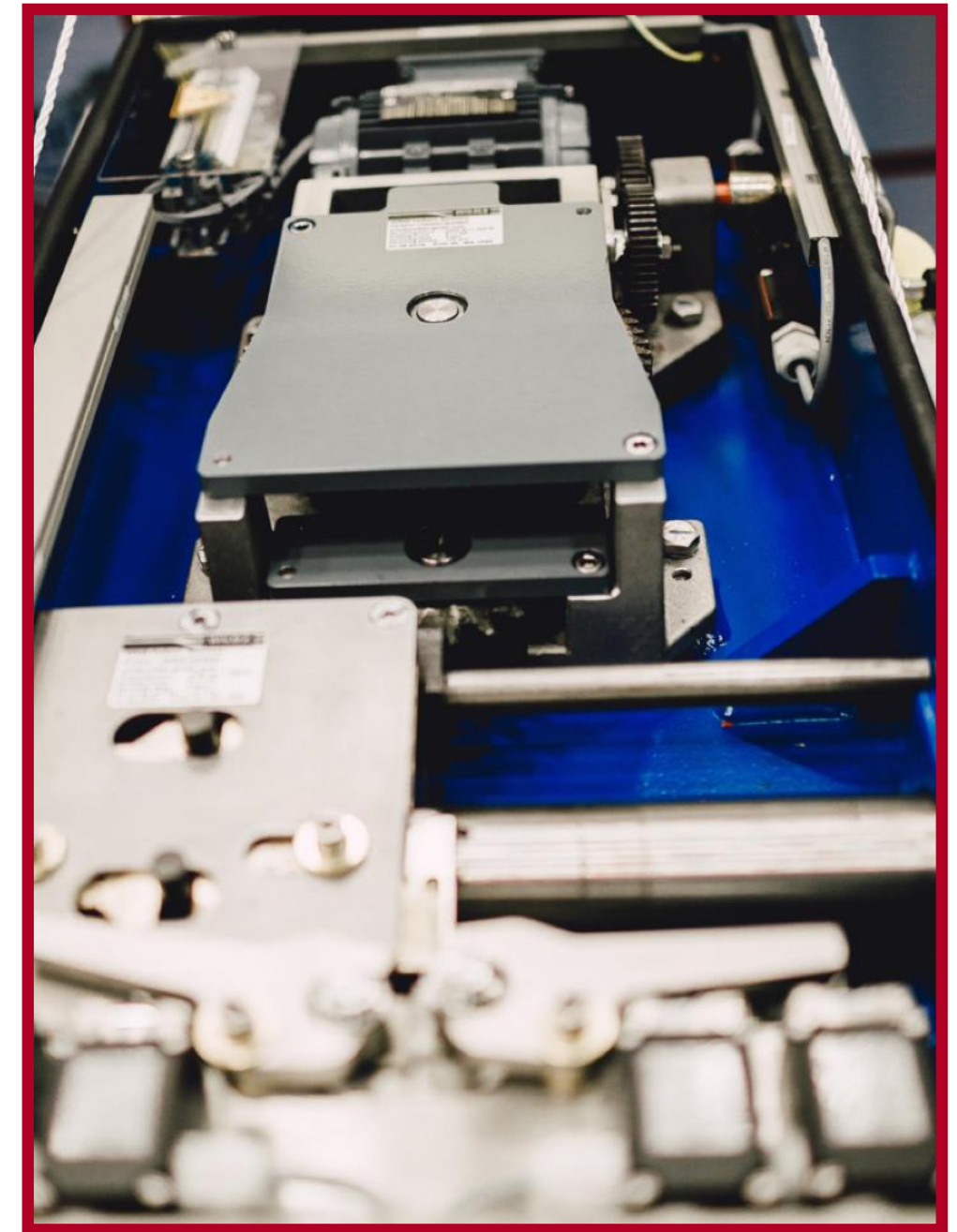
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# Substantial Environmental Benefits

1. Does not contain hydraulic oil thereby eliminating oil leaks either in normal operation or when subjected to high volumes of water such as a flood, sea spray at a port or a harbour. Ideally suited to lines running adjacent to rivers, estuaries and/or the sea.
2. Only requires one cable to operate not two hence minimising the amount of costly material.
3. Low power consumption during operation.
4. High availability means that engine 'idling' and hence Greenhouse Gas emissions from Diesel Trains minimised.
5. Fully recyclable.





# Fenix trailable point machine system (SIL-4 accredited)

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Switch Blade  
Adjuster

Switch Blade  
Adapter

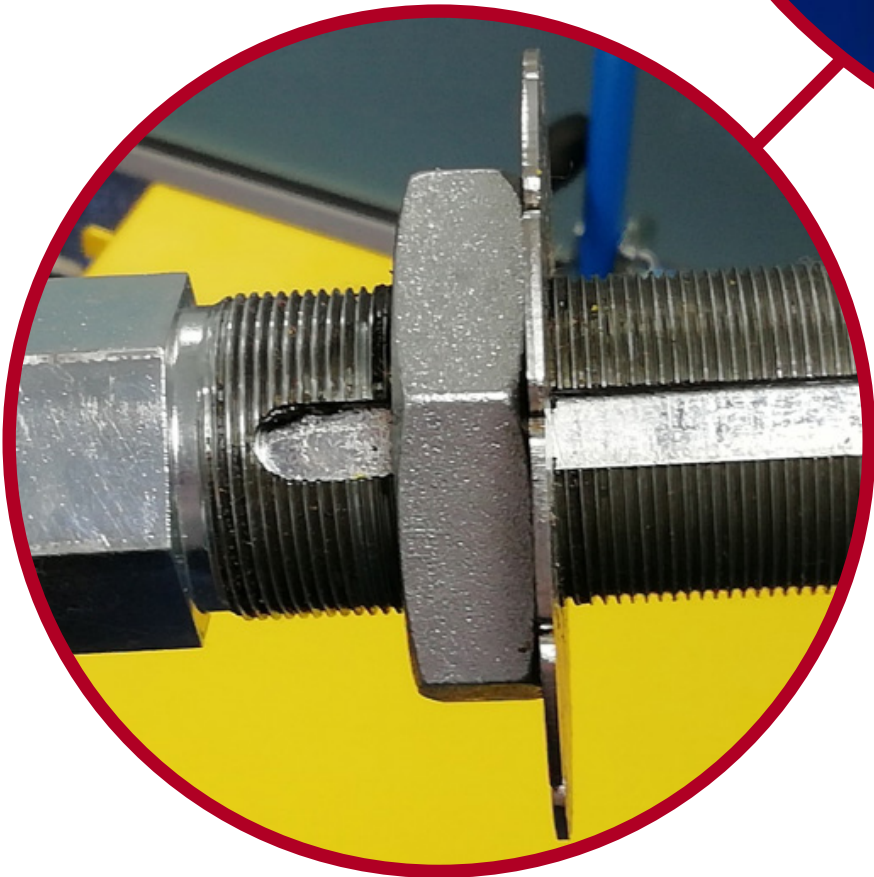
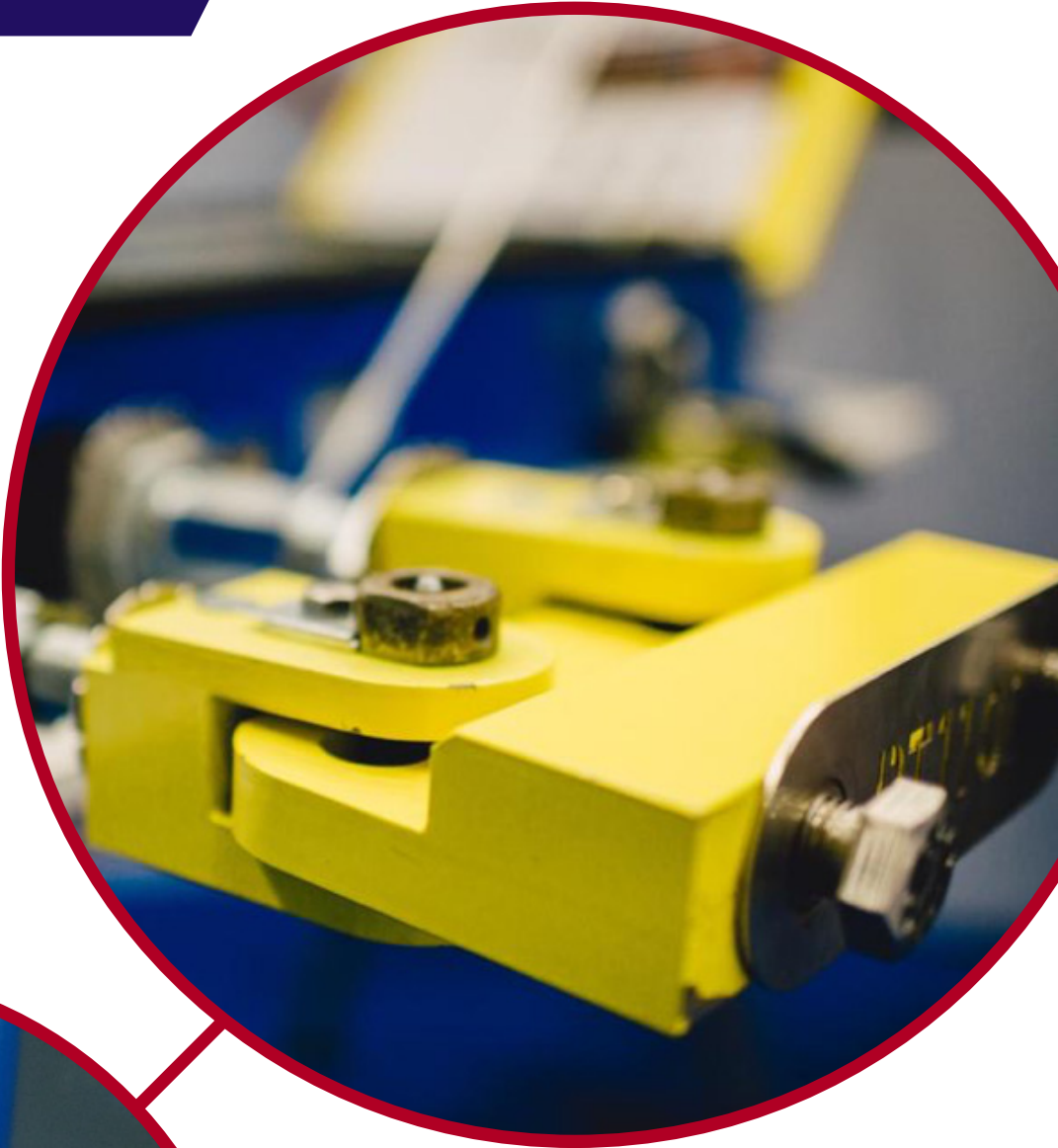


# Compatible with most Track Gauges and any Rail Profile

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## Compatible with most Track Gauges

Track Gauge (SI) (mm)	Track Gauge (Imperial) (feet, inches)
1,372	4 ft 6 in
1,435	4 ft 8 1/2 in
1,520	4 ft 11 27/32 in
1,524	5 ft
1,600	5 ft 3 in
1,668	5 ft 5 21/32 in
1,676	5 ft 6 in



Special adapters  
allow fitting to  
ANY Rail Profile.

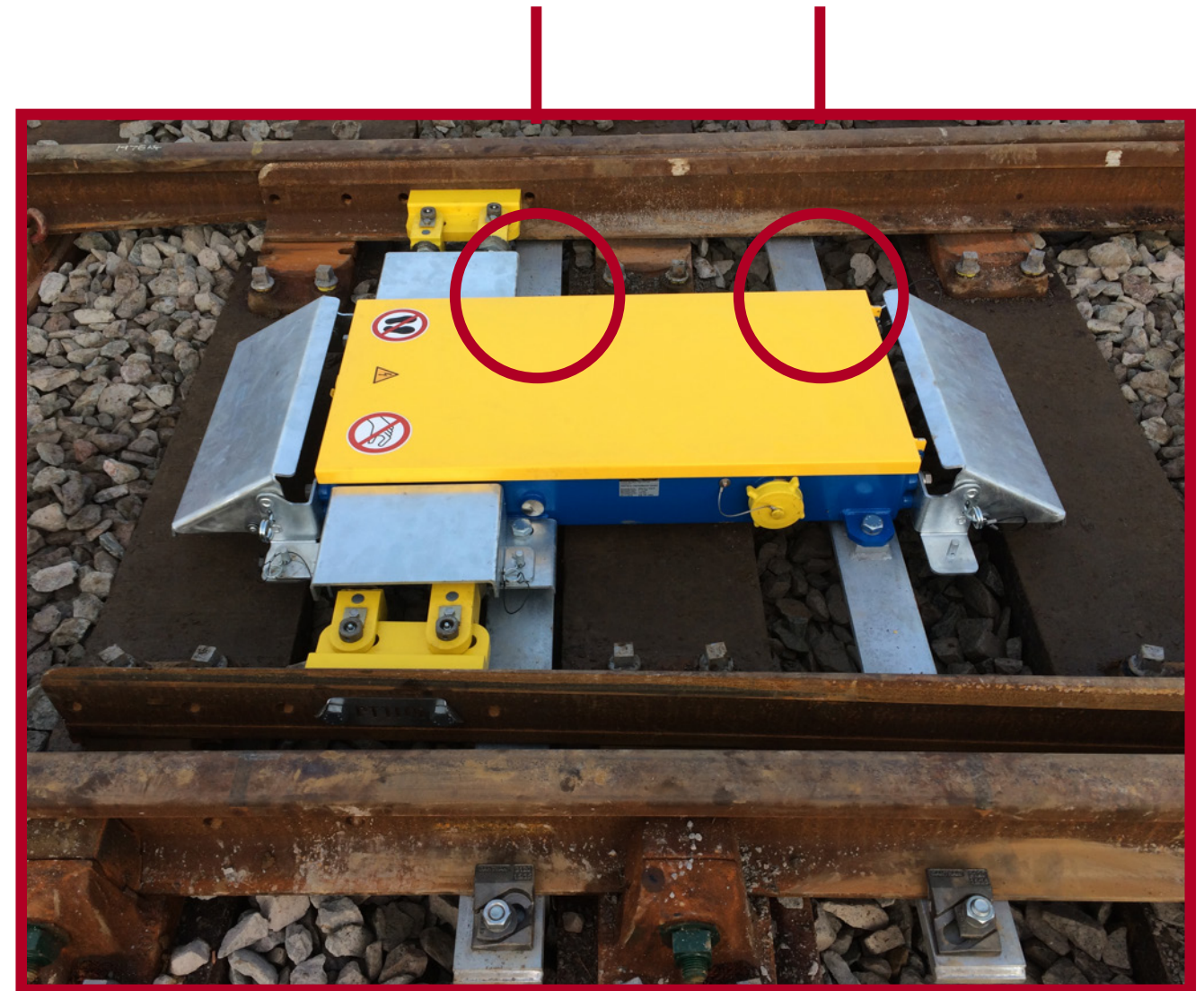


# Point Machine System - Mounting Bars

Mounting Bar



Mounting Bars





# Fenix point machine – Switch Rail Adapter

The Switch Rail Adapter is the main part of the Point Machine System that changes to suit the type of rail profile including CEN60, BS113, Bull Head, etc, etc.

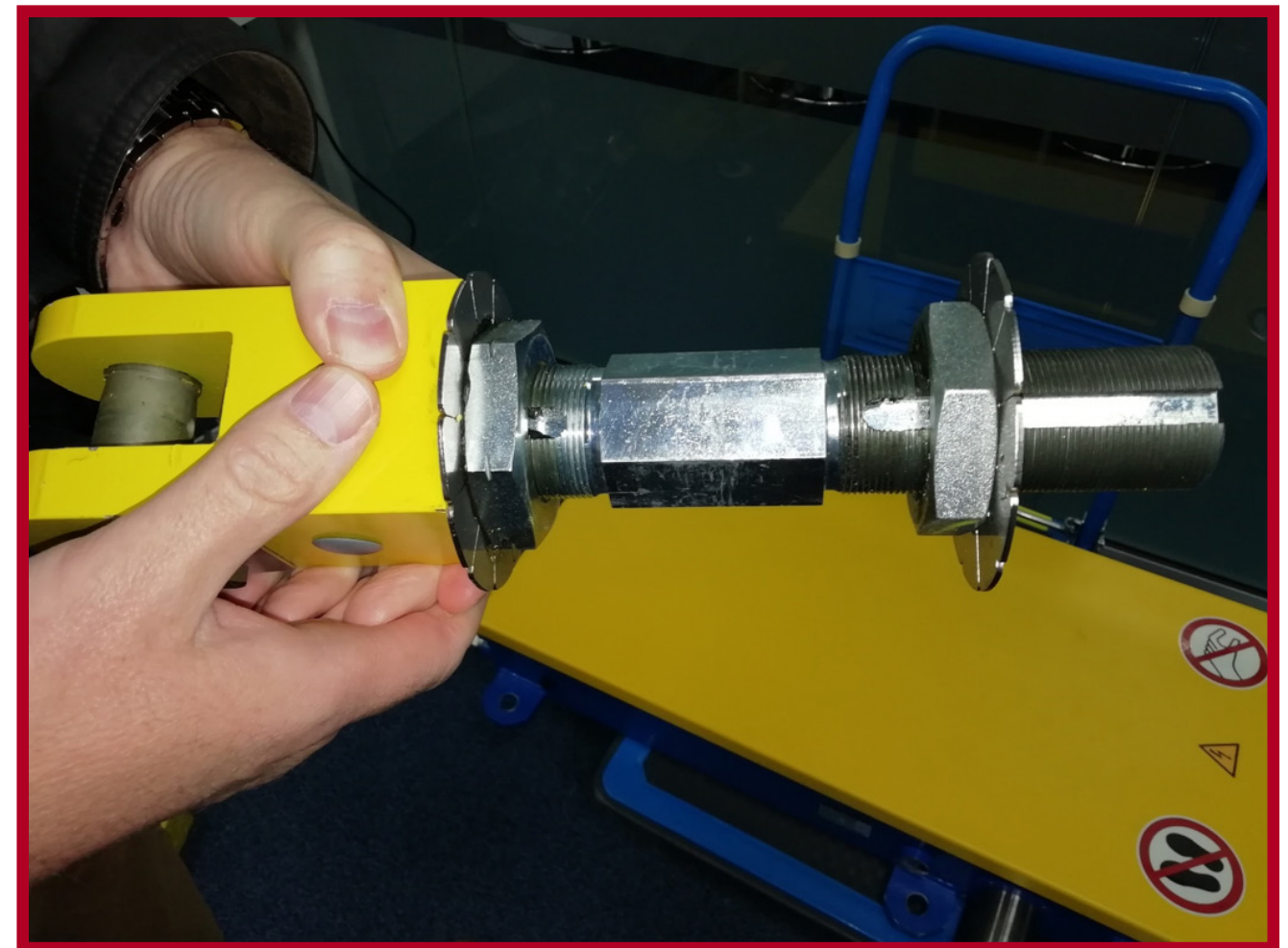
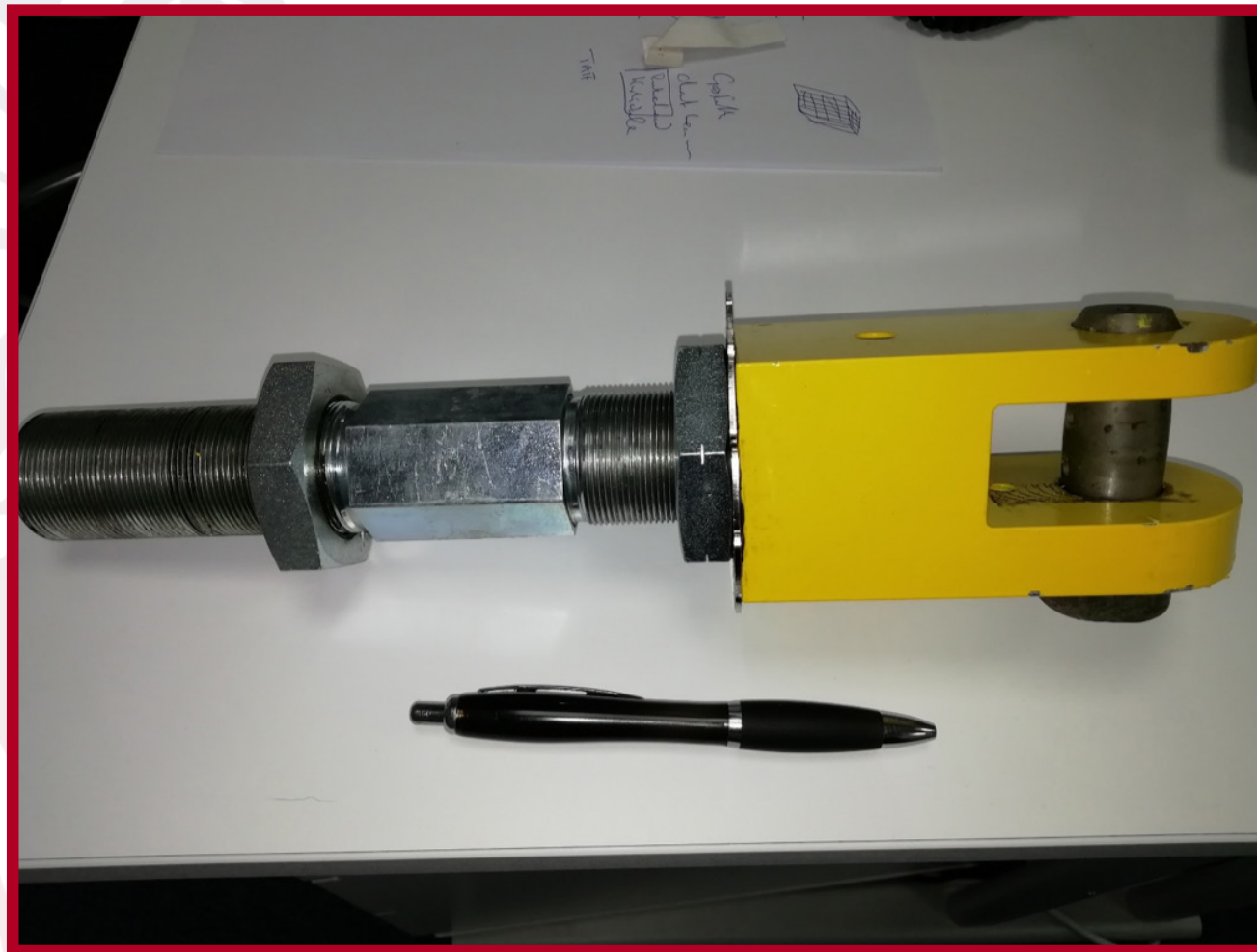




# Fenix point machines - Detection Rod Adapter

This Adapter connects the Detection Rod to the Switch Rail.

This means that only the detection rods and switch rail adapters are the only parts of the Point Machine System that vary in size.

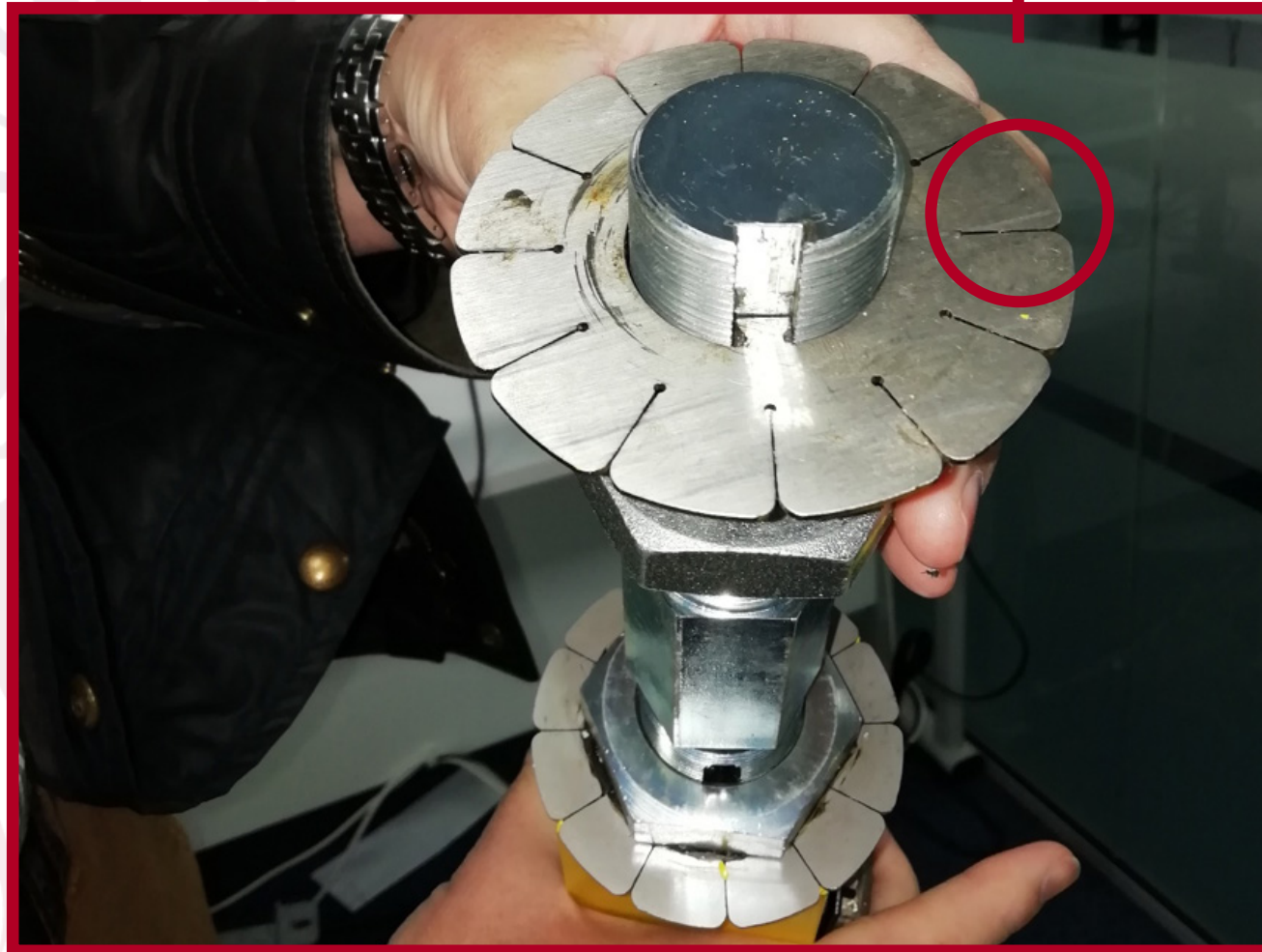




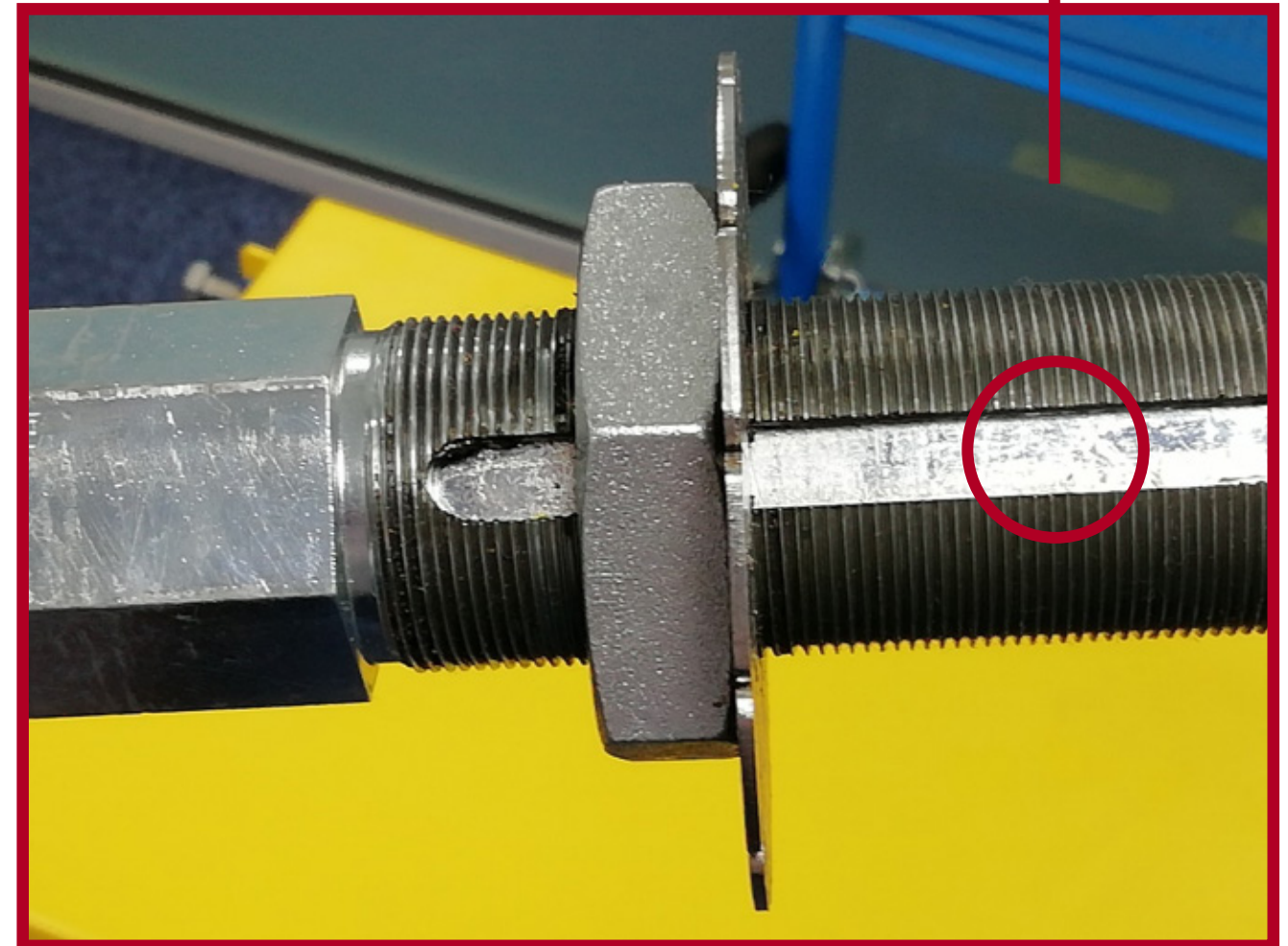
# Fenix point machine - Nut Locking Flower Plate

Once installed the 'Nut Locking Flower' plate is bent over and together with the locking groove prevents the locking nut from becoming freed by the vibration of passing rail traffic.

Nut Locking  
Flower Plate



Nut Locking  
Groove





# Available with a 'Back Drive.'

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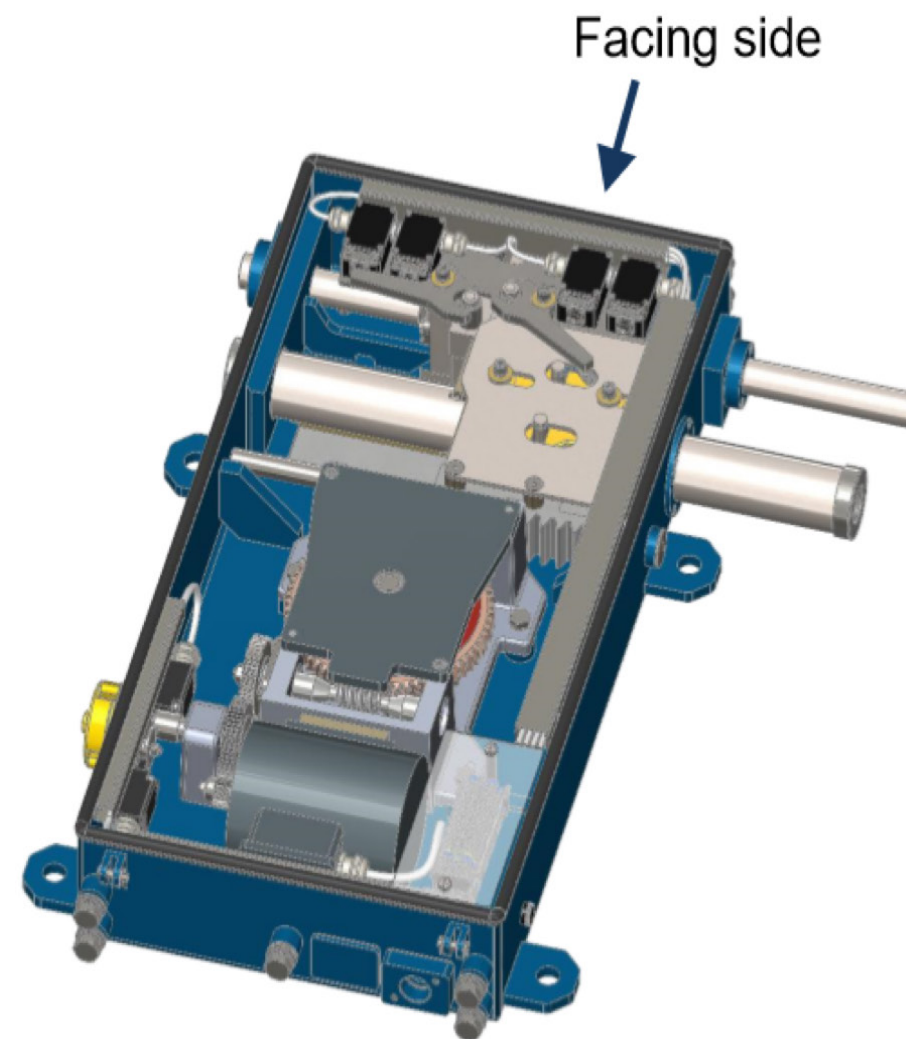




# Fenix trailable point machine system (SIL-4)

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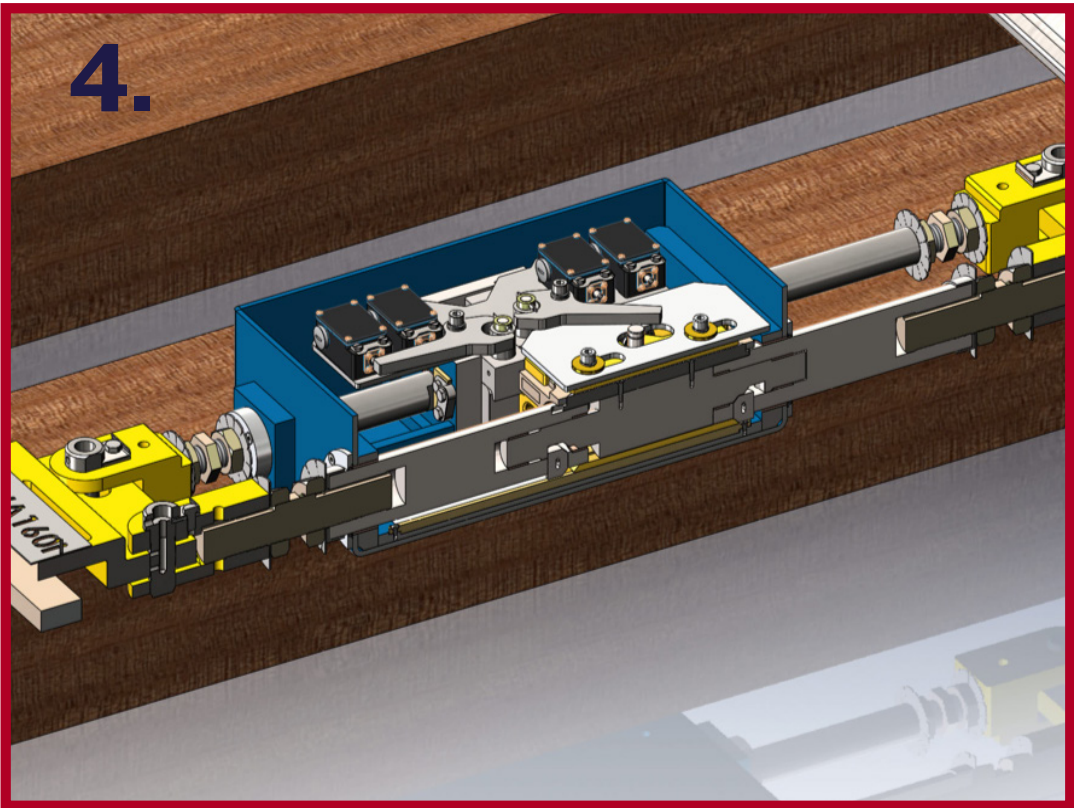
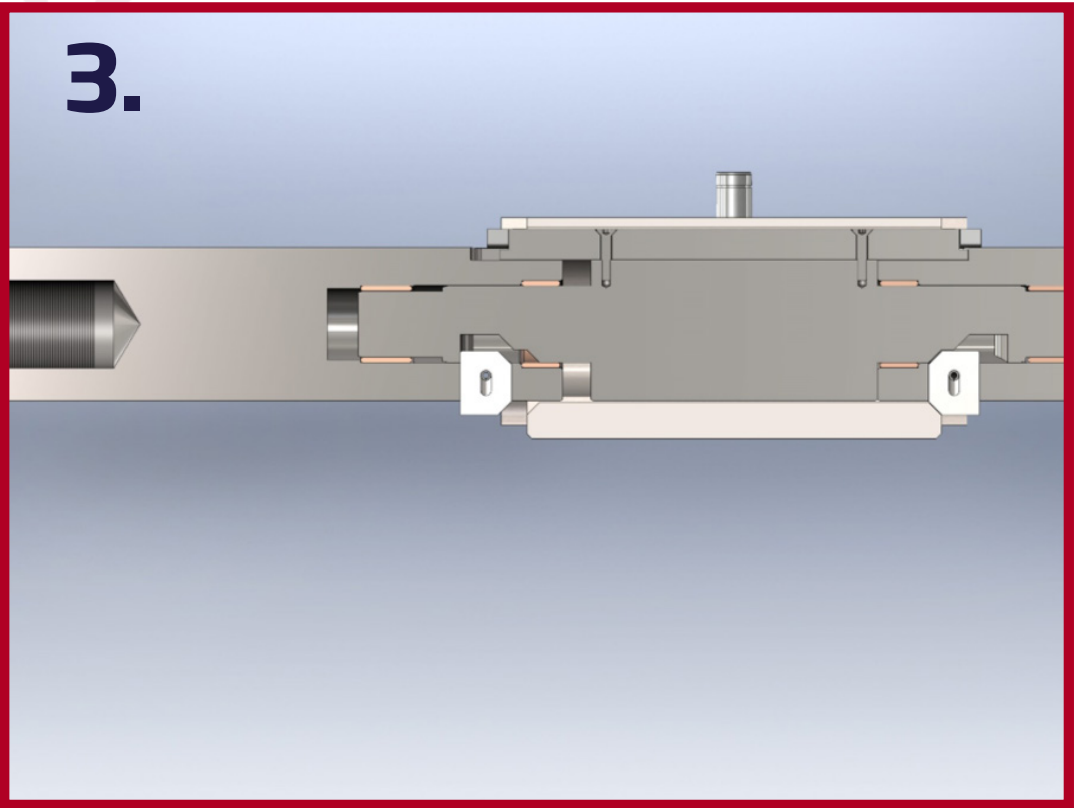
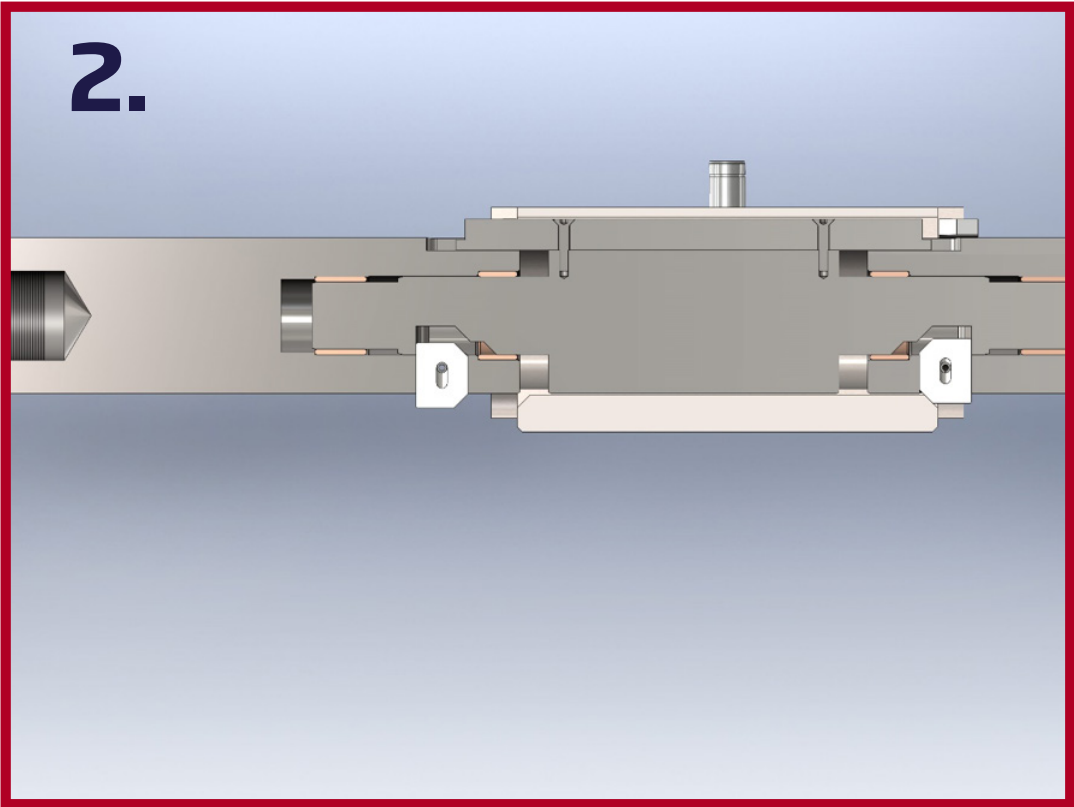
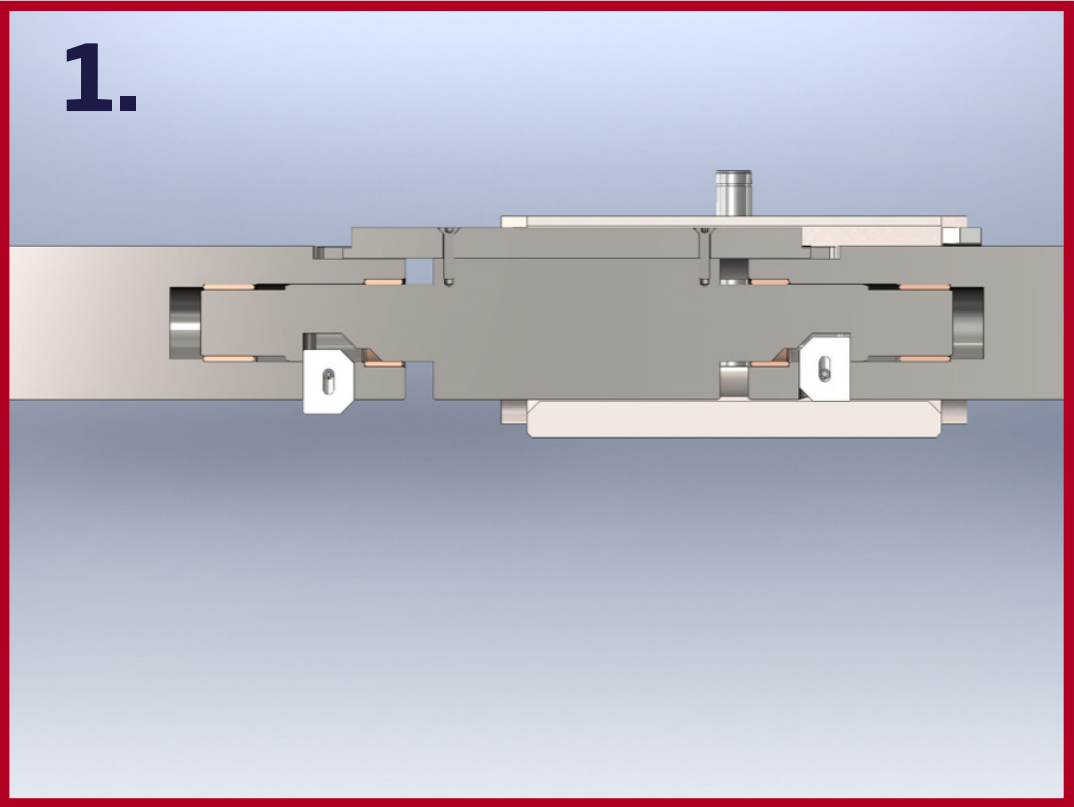
Facing point lock system  
WA 110i-V – WA 160i-V





# Point Machine System - Cross-Section Inner Workings

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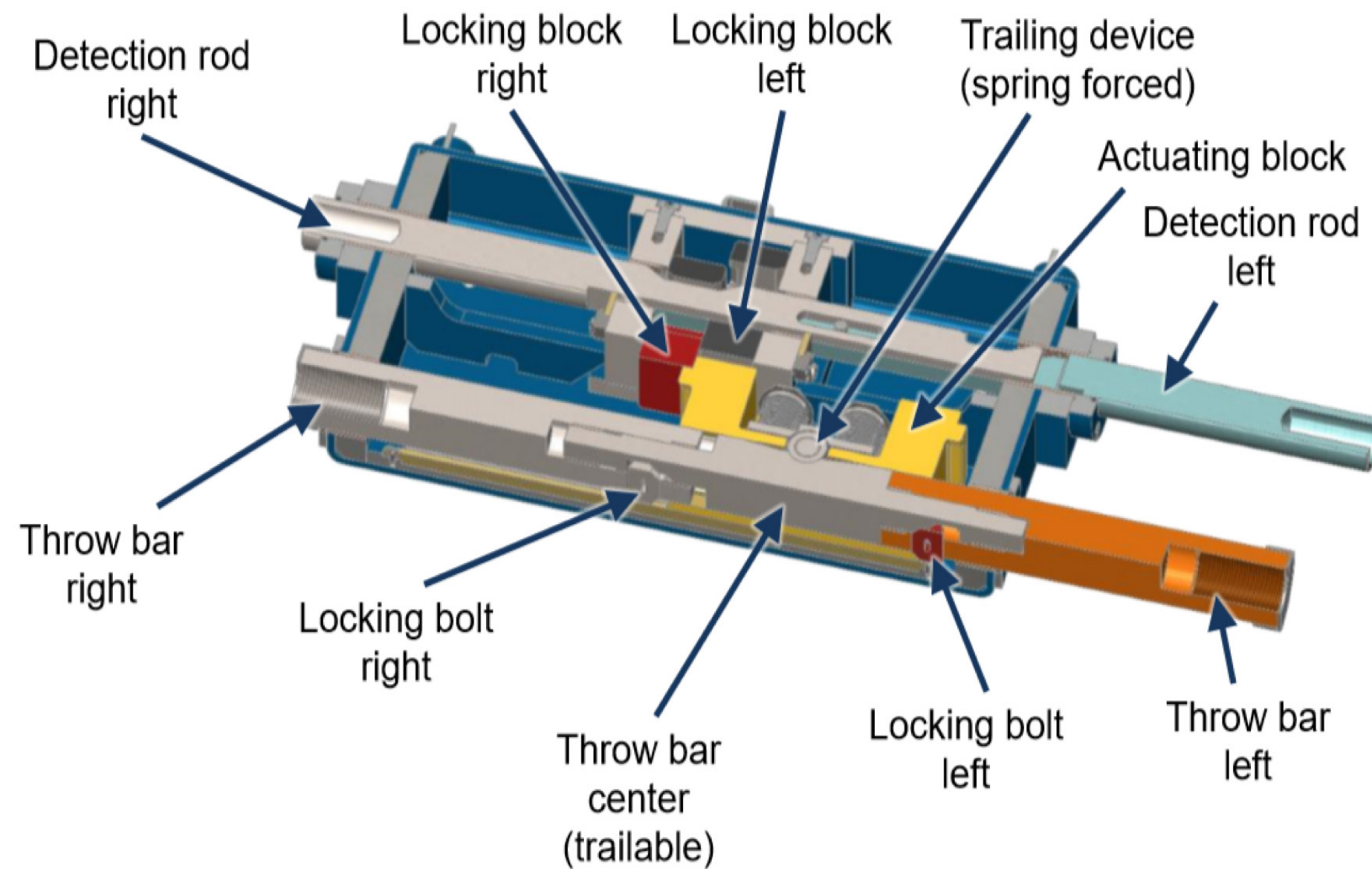




# Operational sequence

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Facing point lock, active in direction right

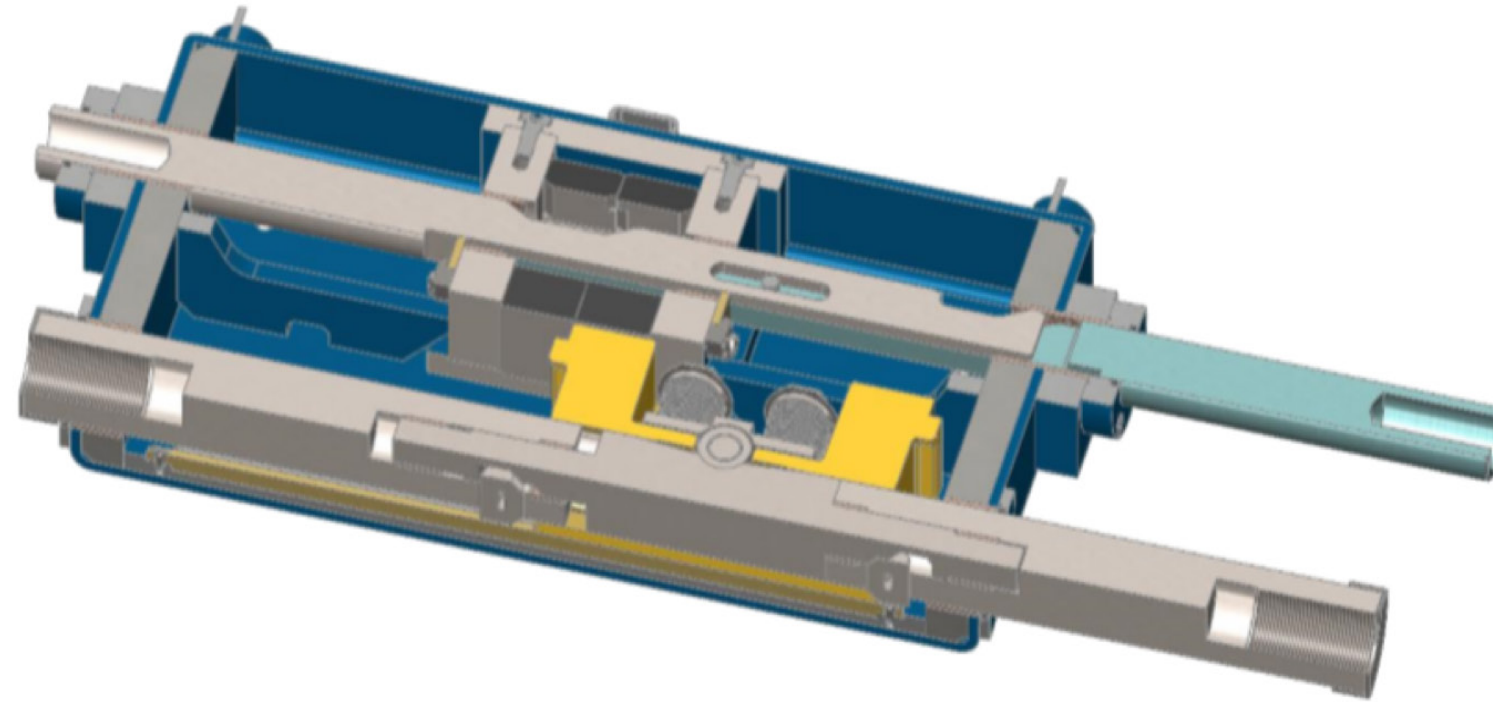




# Operational sequence

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Facing point unlocked in direction right

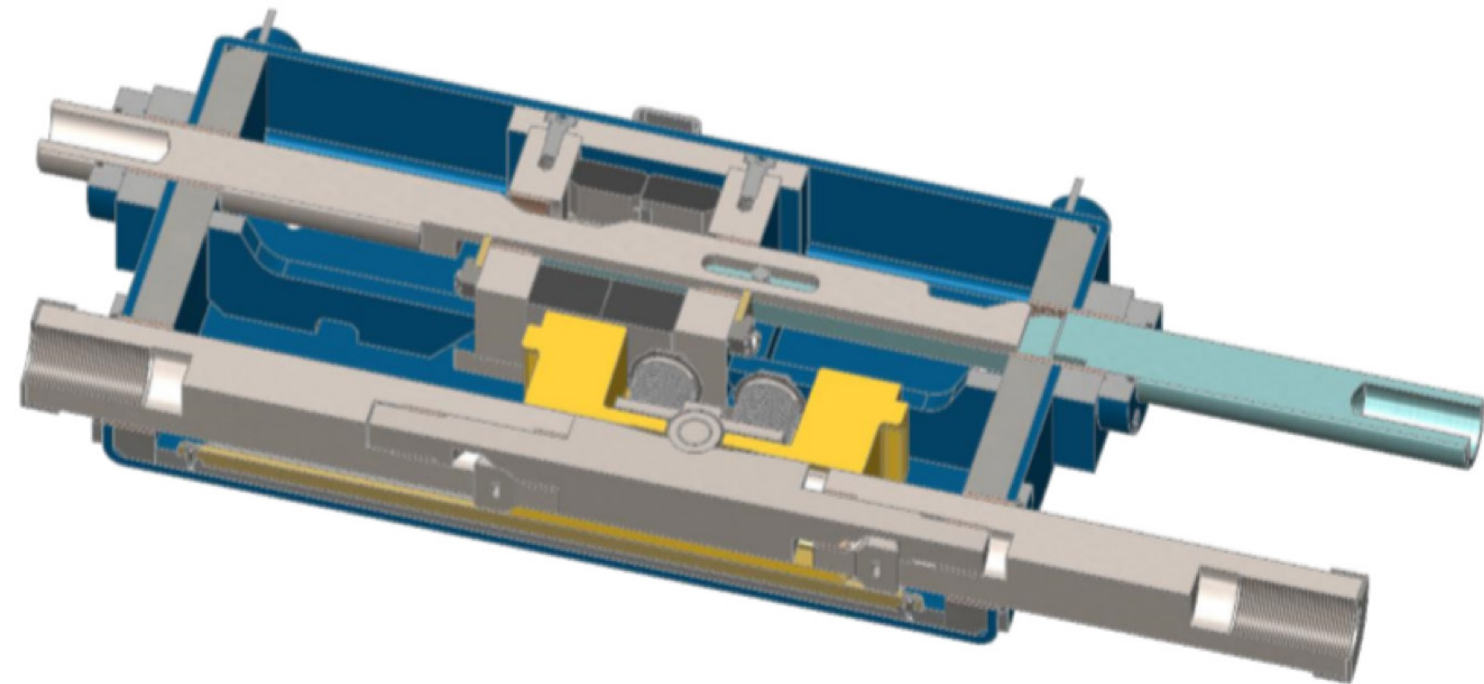




# Operational sequence

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Moving to from direction right to direction left

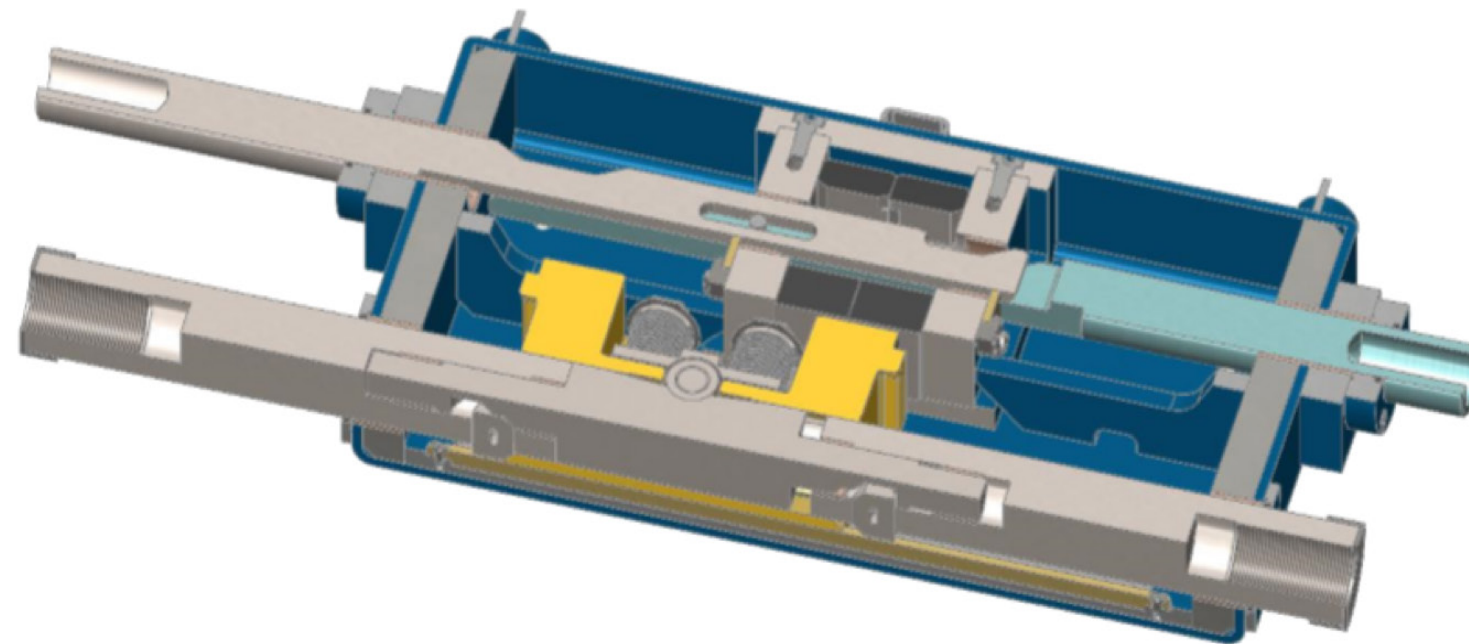




# Operational sequence

c Fenix Signalling Ltd 2019

Moving to from direction right to direction left

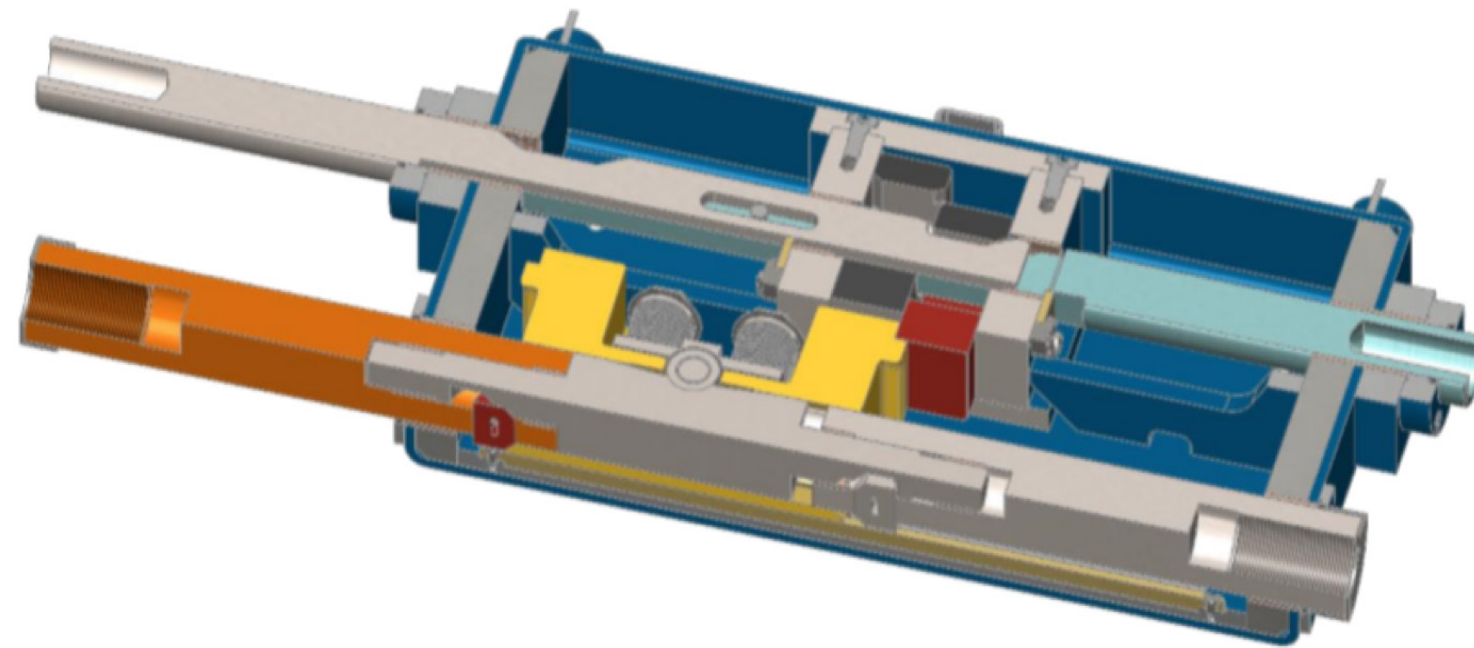




# Operational sequence

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Facing point lock, active in direction left

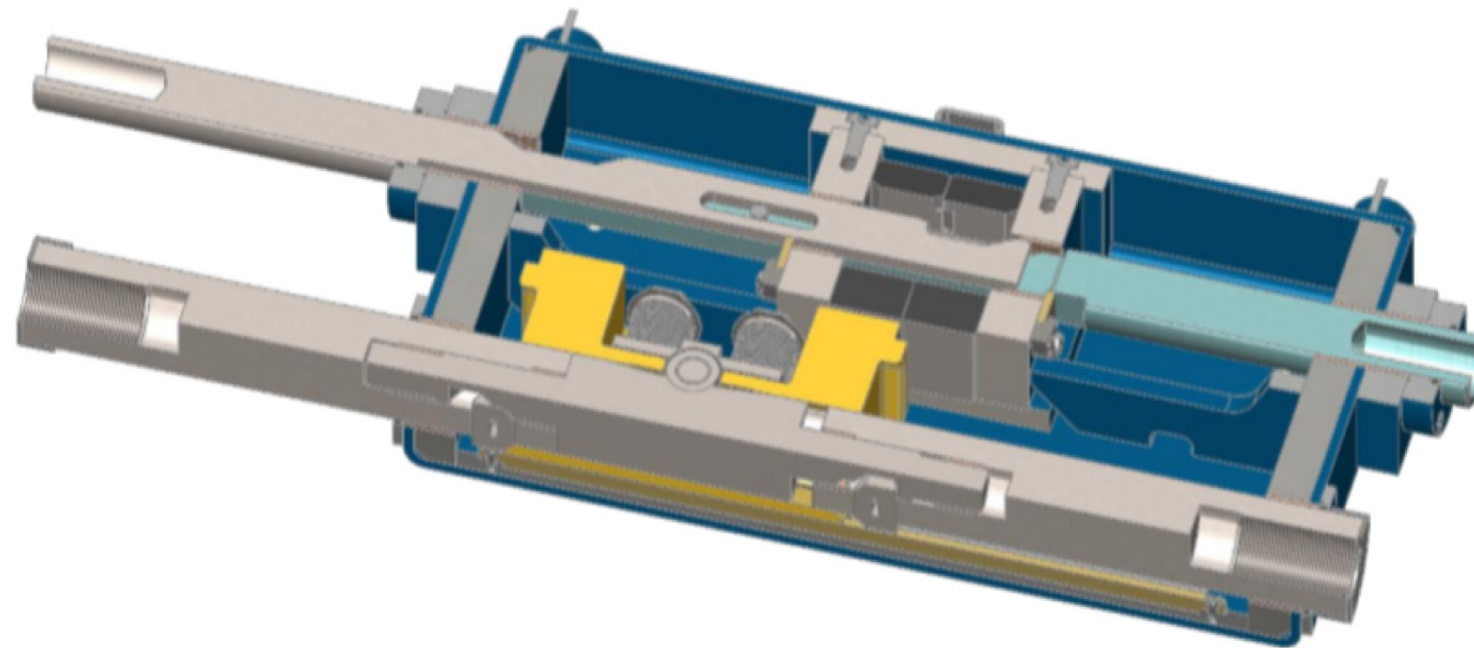




# Operational sequence

c Fenix Signalling Ltd 2019

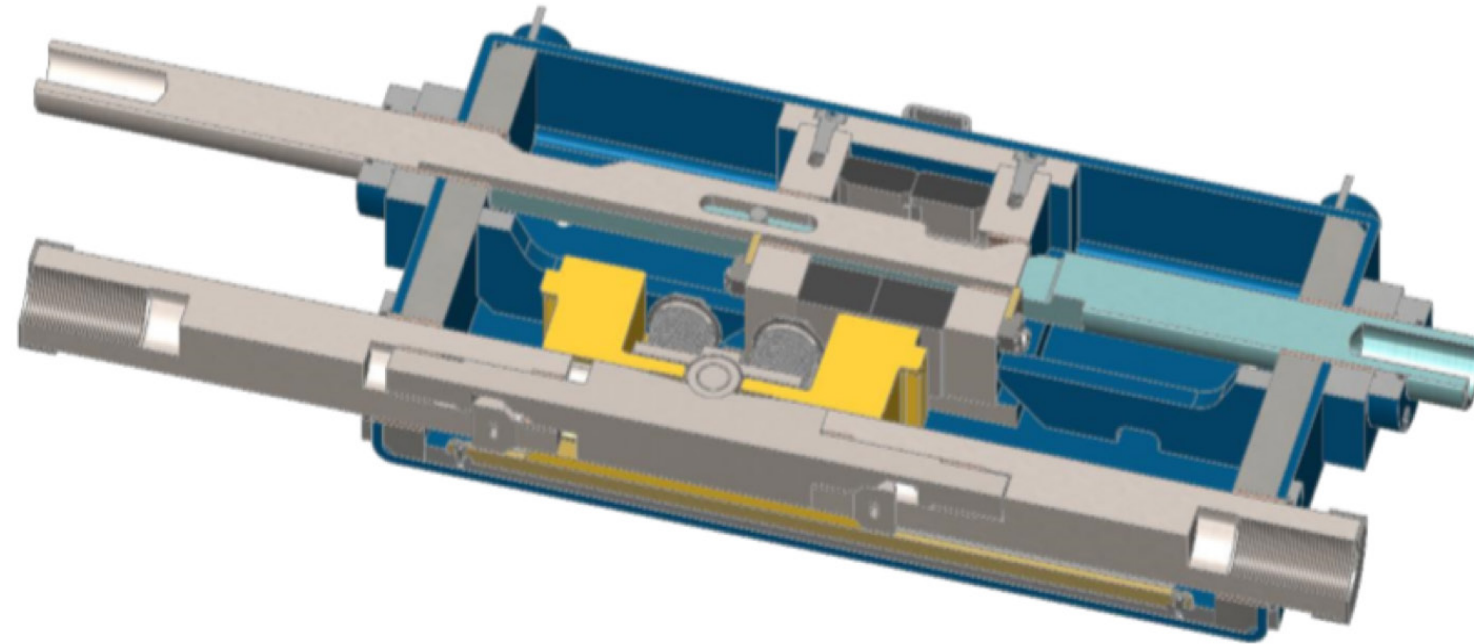
Unlocked in direction left



# Operational sequence

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Moving from direction left to direction right

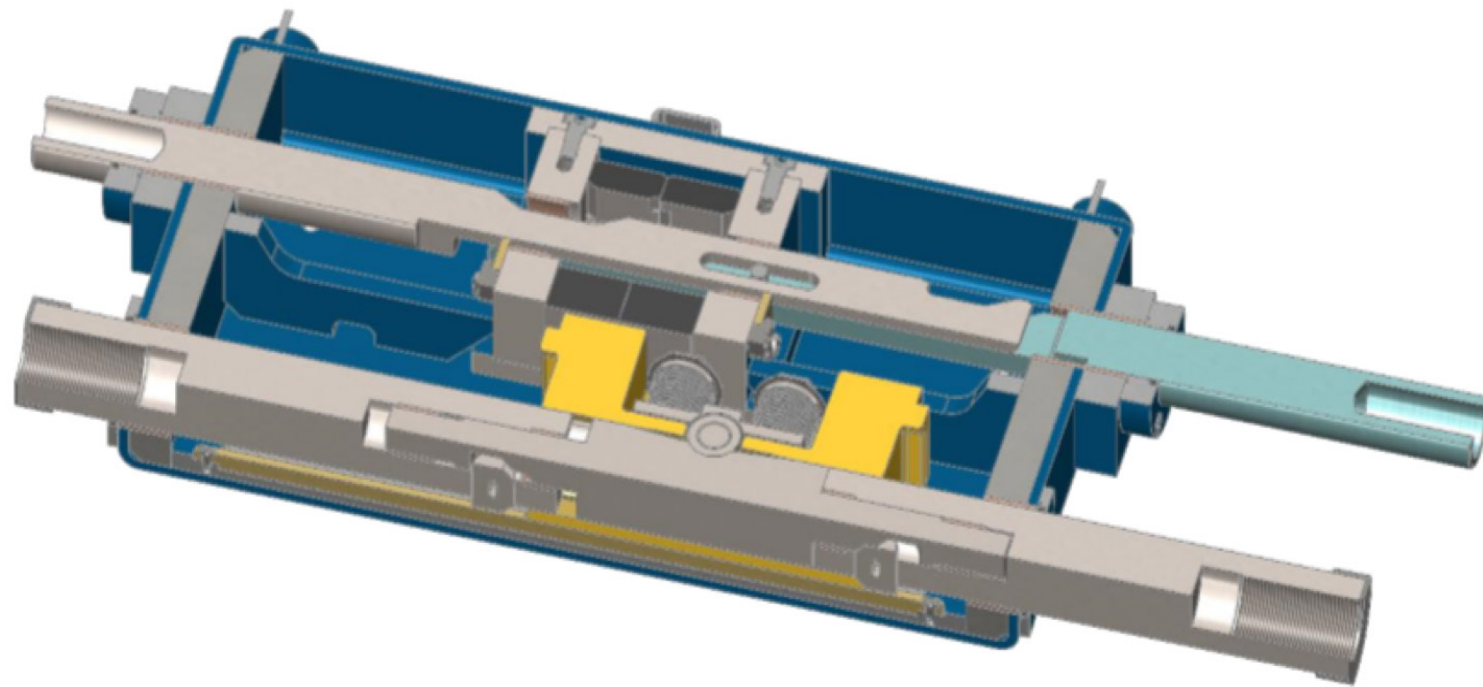




# Operational sequence

c Fenix Signalling Ltd 2019

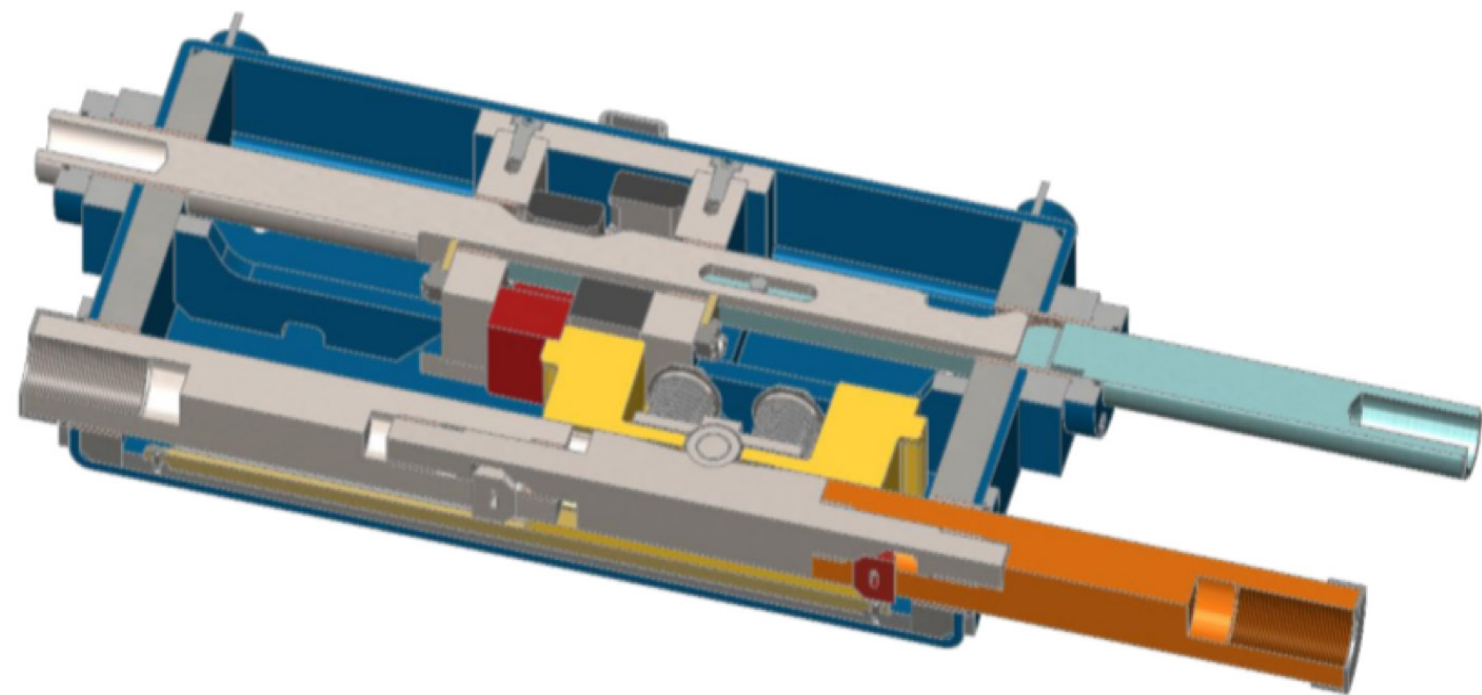
Moving from direction left to direction right



# Operational sequence

c Fenix Signalling Ltd 2019

Facing point lock, active in direction right



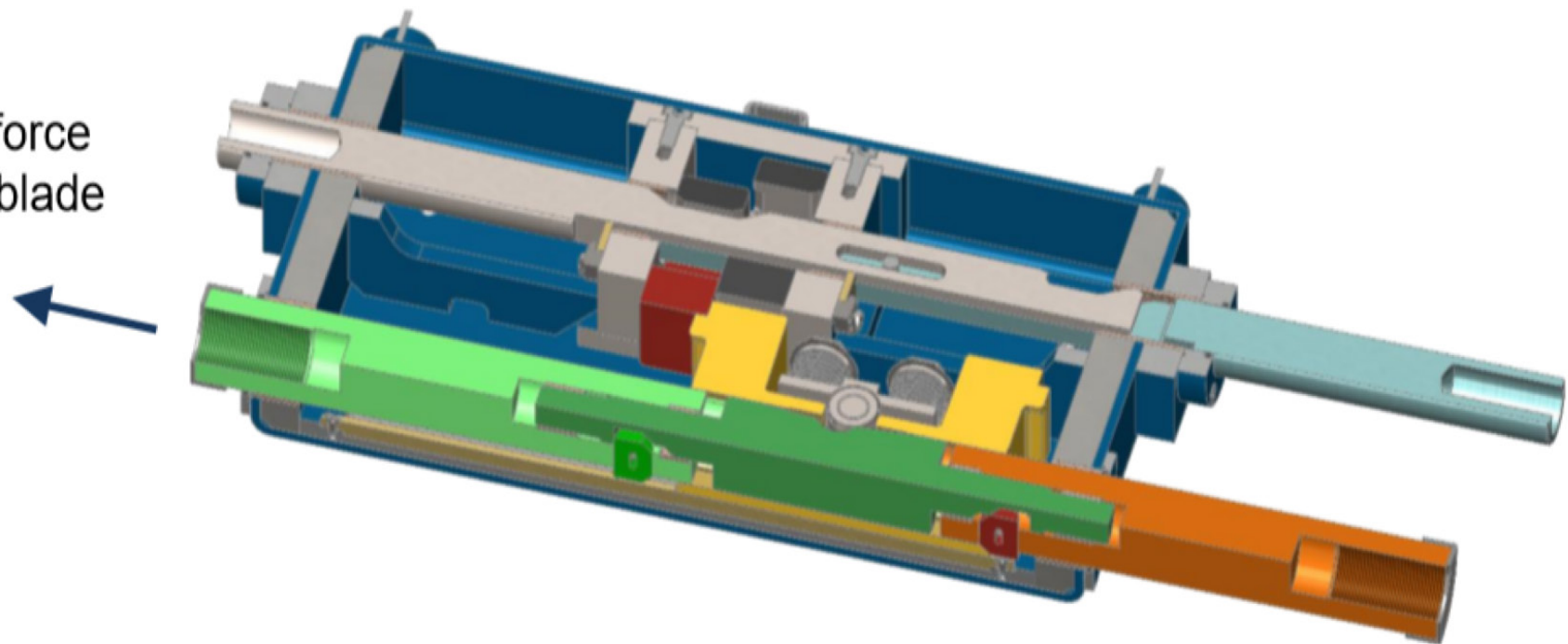


# Operational sequence

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Trailing from direction right to direction left  
Begin of trailing, facing point lock still active

Trailing force  
at open blade

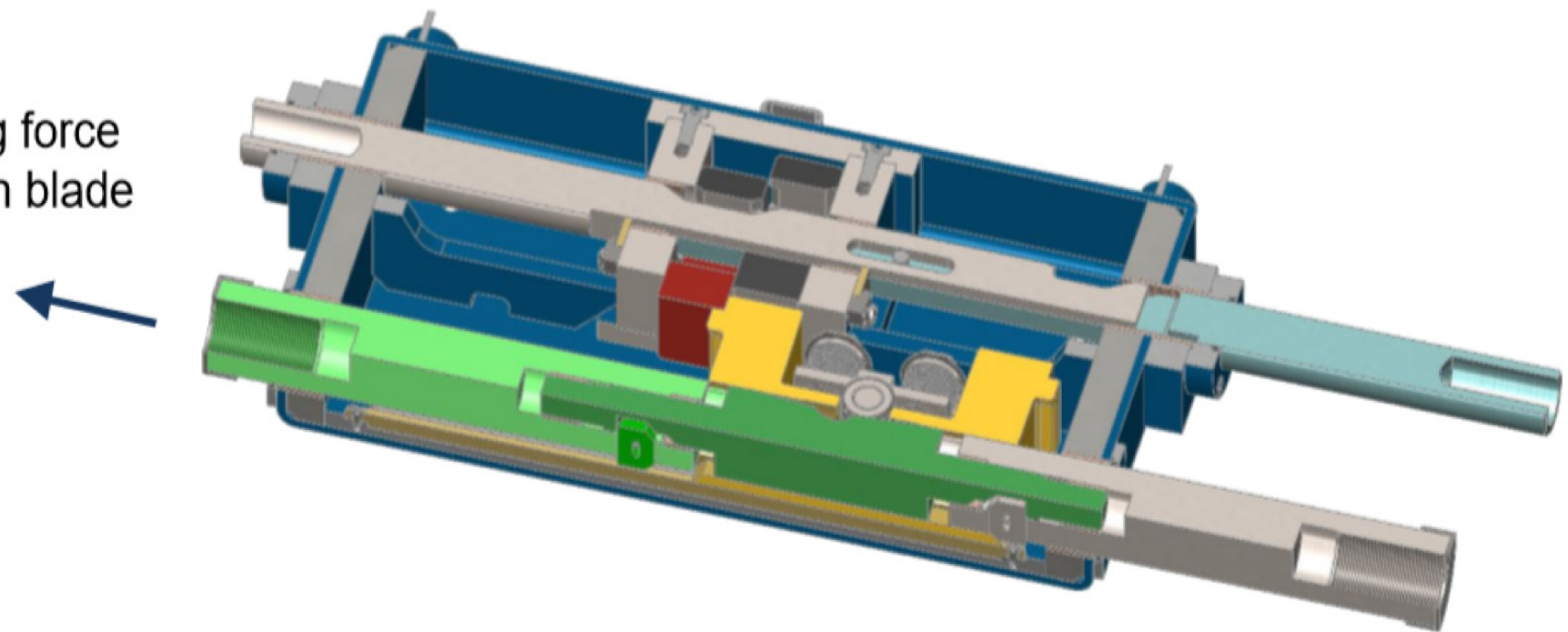


# Operational sequence

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Trailing from direction right to direction left  
Trailing to direction left, facing point lock open

Trailing force  
at open blade

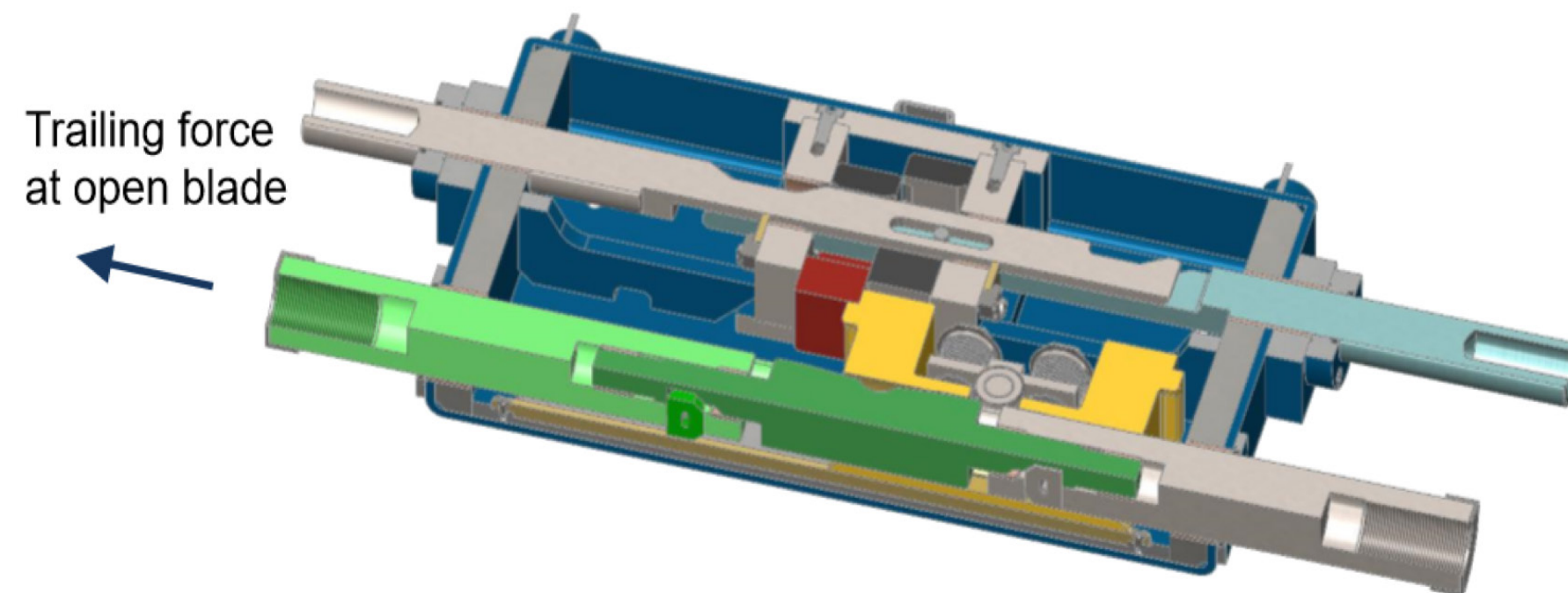




# Operational sequence

c Fenix Signalling Ltd 2019

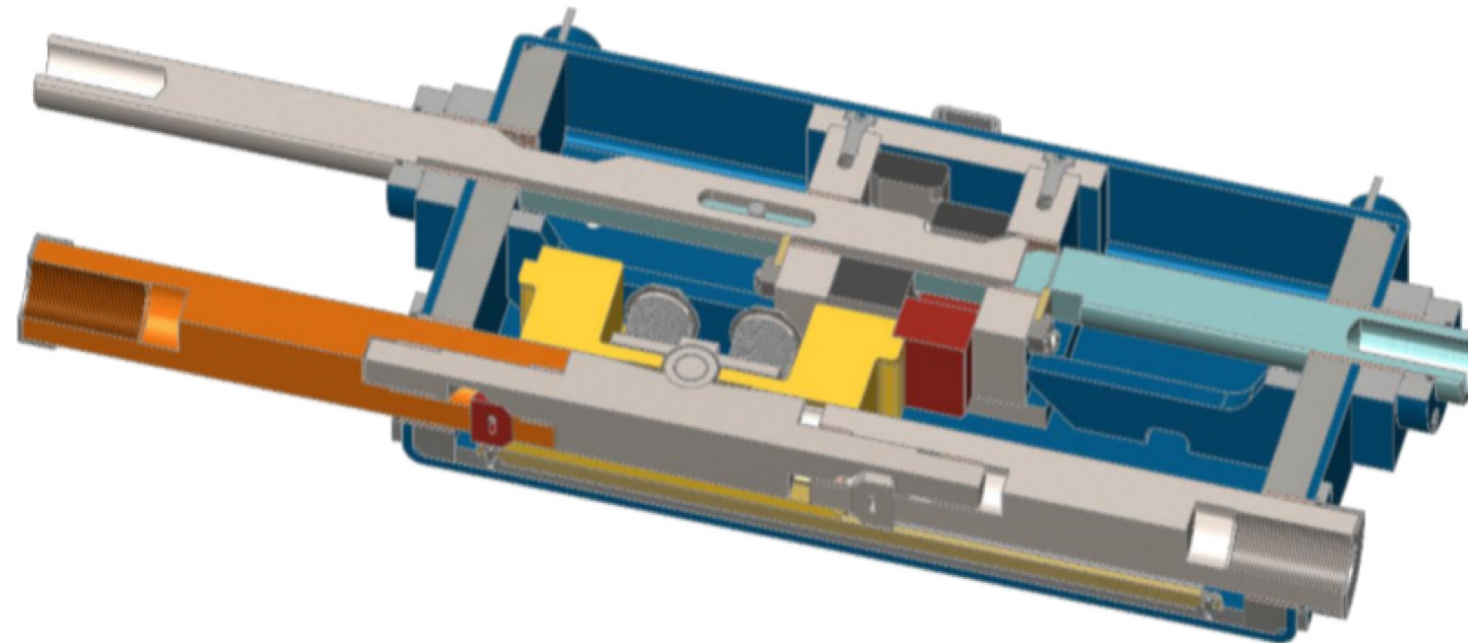
Trailing from direction right to direction left  
Trailing to direction left, facing point lock open



# Operational sequence

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Trailing from direction right to direction left  
After reset of trailing  
Facing point lock, active in direction left





# Operational sequence

1. Trailable point machine with in-built facing lock.
2. Easy to install.
3. Minimal maintenance.
4. Light weight - 110kg
5. Powered by 400V 3 Phase Neutral or 110V-120V DC electrical supply
6. Typically 3 second response.
7. Verified for 1 million cycles (833 hours of running time over a 30 year period).
8. Compatible with any rail traffic, axle loading or line-speed.
9. Casing manufactured from powder coated stainless steel.
10. All rods manufactured from stainless steel.
11. Independently tested:
  - a. To work underwater to a depth of 1000mm.
  - b. To work in a saltwater environment;
  - c. To operate within a temperature range of +85C to -40C.
12. SIL-4 accredited.
13. A value for money solution.





# THANK YOU

For further details of the Fenix trailable point machine system (SIL-4 accredited) contact:

**Craig Purcell**

**Email:** [craig.purcell@fenixrailsystems.com](mailto:craig.purcell@fenixrailsystems.com)

**Mobile:** 07525 177307

**[www.fenixrailsystems.com](http://www.fenixrailsystems.com)**

