Fenix
RAIL SYSTEMS

PINMOVIO 550 - POINT MACHINE

FS-DES-STD-01
Version 5.0

SIL-4 Face Lock Trailable Point Machines - Overview

The PINMOVIO 550 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 externa 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 **enable** the machine to **perform** in unison to the track when train movements are present such that the machine become 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.

Trailable point machine system (SIL-4)

1. The 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.

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**;**

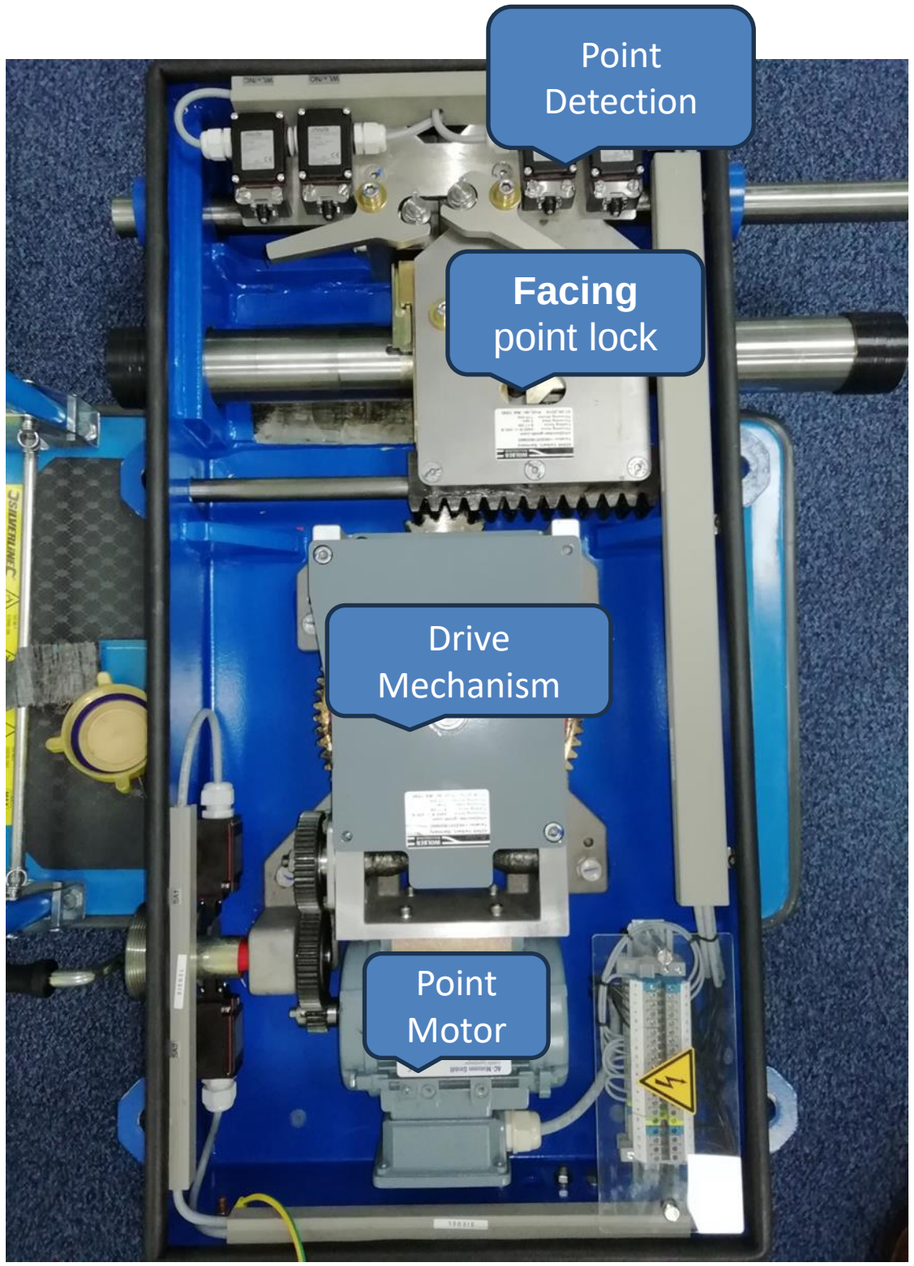
e. **Internal** mechanical locking system;

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.



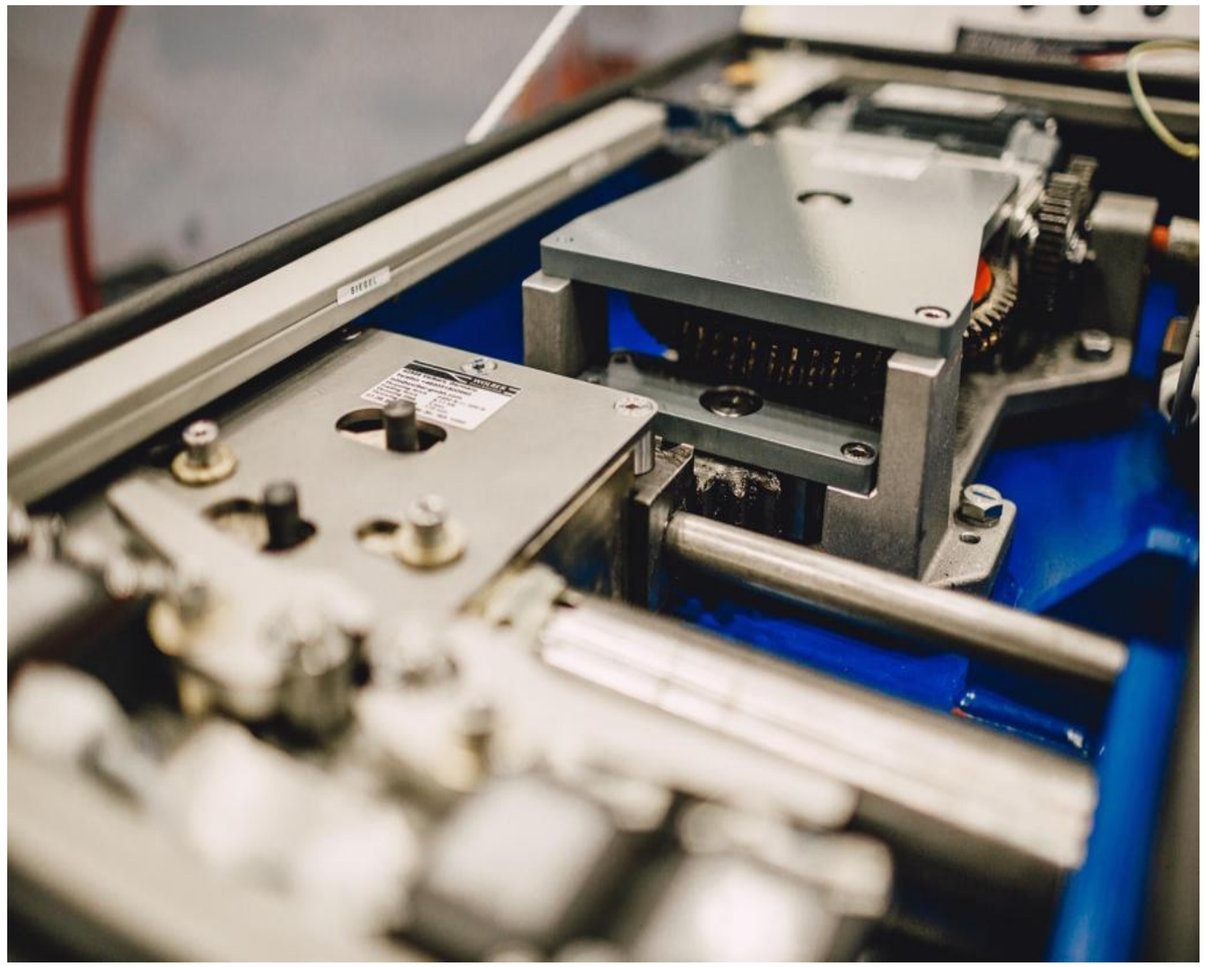
Fenix trailable point machine system (SIL-4)

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**.**



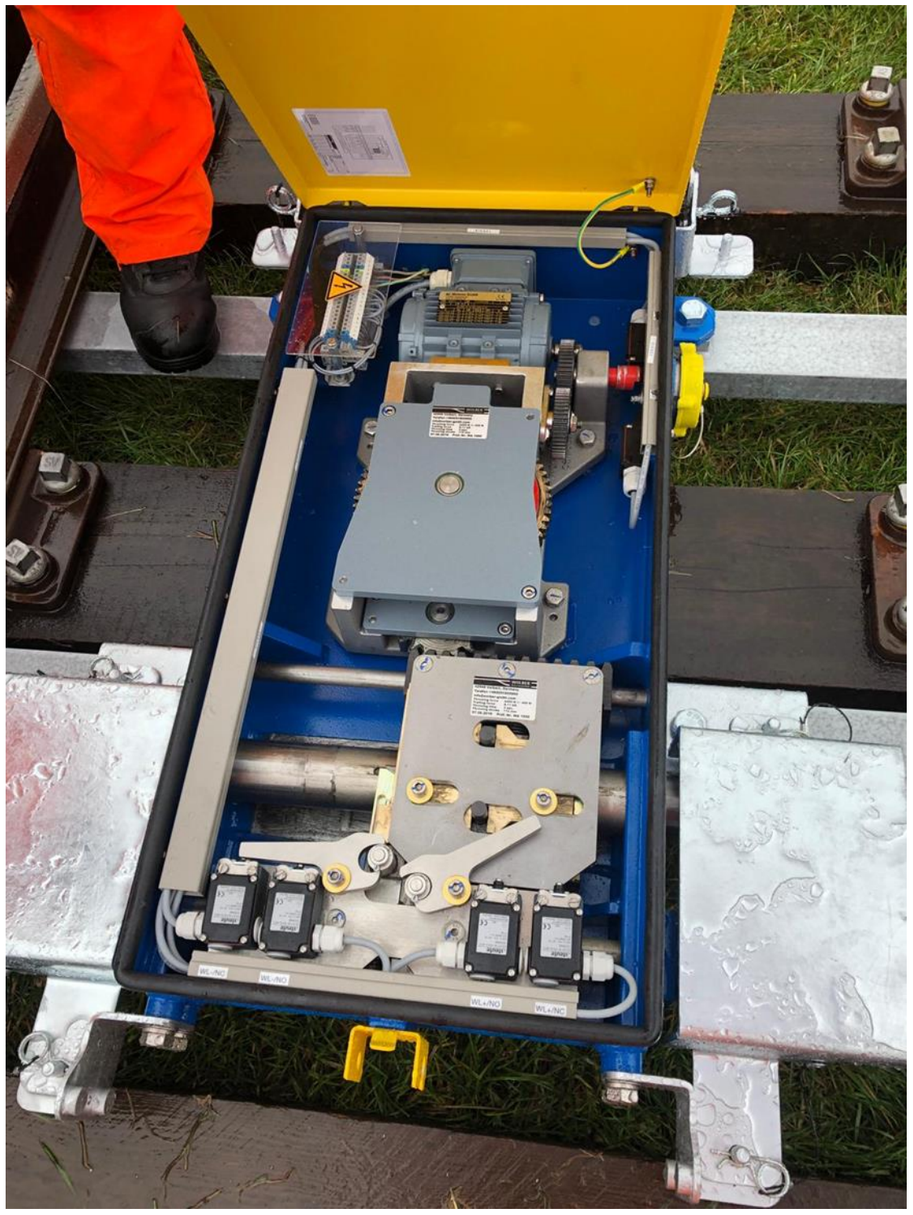
Trailable point machine system (SIL-4)

1. The detection and power are supplied by a **single** 4 core cable. Powered by a a three-phase **400V AC supply**, although a **110V DC** variant is also available.

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.

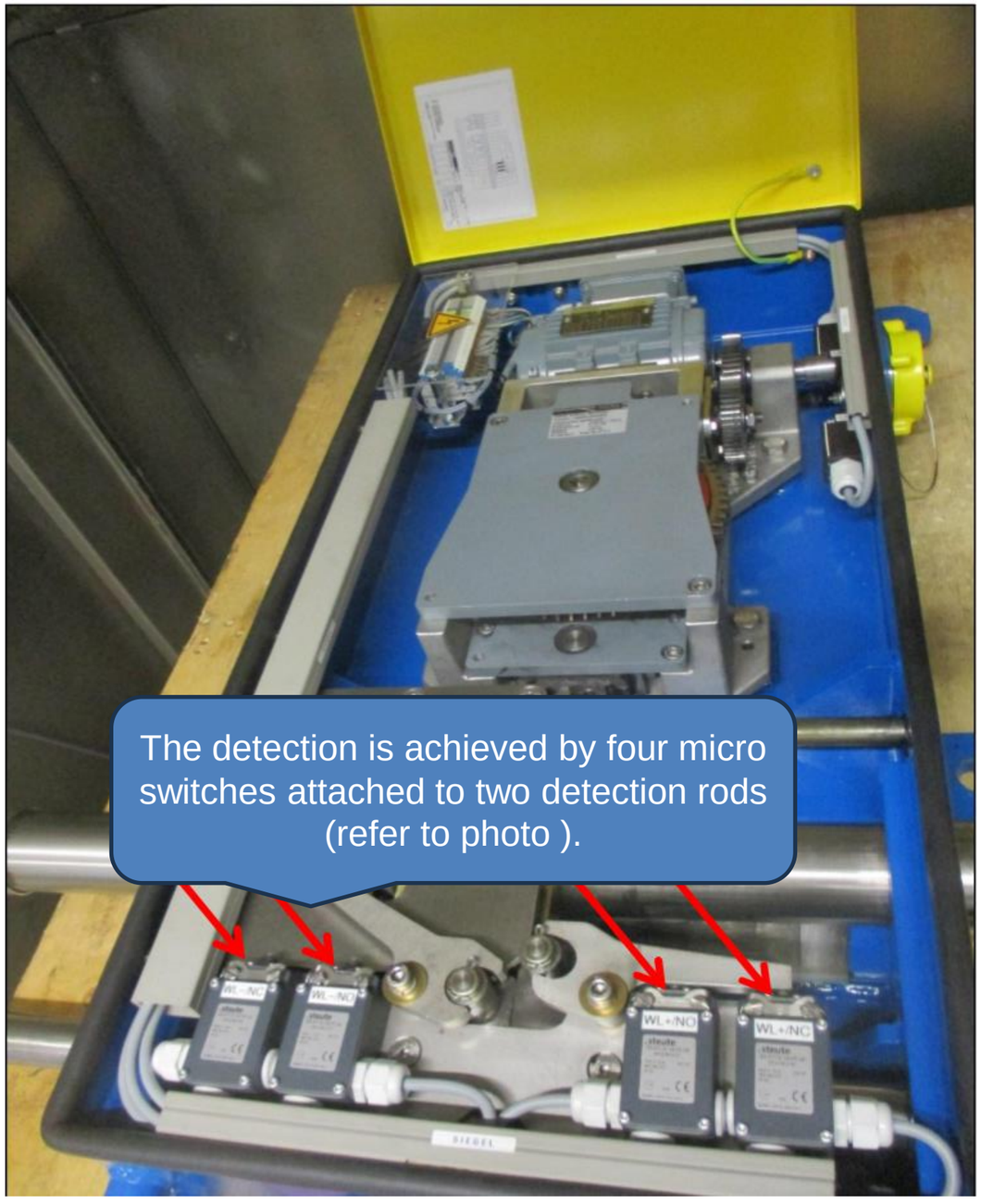


Trailable point machine system (SIL-4)

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 revert to the non-trailing position to **prevent damage** to the infrastructure/train.

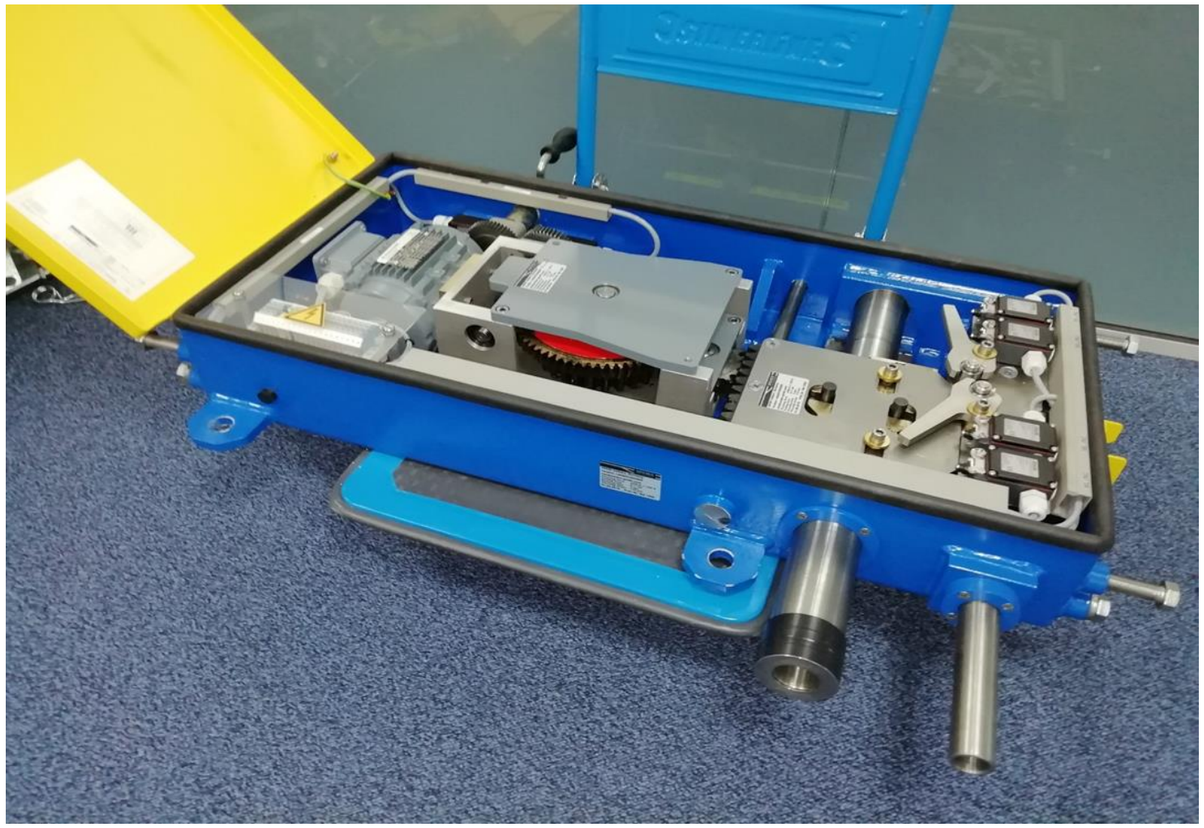
3. The machine is driven by an electric motor which is geared down to drive the switch blades by two rods. The rods feature a spring mechanism to prevent breaking when the machine is trailed. The detection is achieved by four micro switches attached to two detection rods (refer to photo below).



Trailable point machine system (SIL-4)

1. There is a 4-core cable which is terminated on L1,L2,L3 and N - this cable has **two** functions.
   a. Firstly it uses a 400V 3 Phase Neutral supply that **drives** the point motor which in turn moves the point blades to the Left or Right hand side;
   b. Secondly, the same cable is used for the **detection** via the 24Vdc supply through the detection switches.

2. Once the switch blade has reached its end position, the micro switches **operate** the interlocking **cutting** the drive to the machine. The 24Vdc supply is continually **monitored** to ensure that the points are **locked** and **detected** in the **correct** position.



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).

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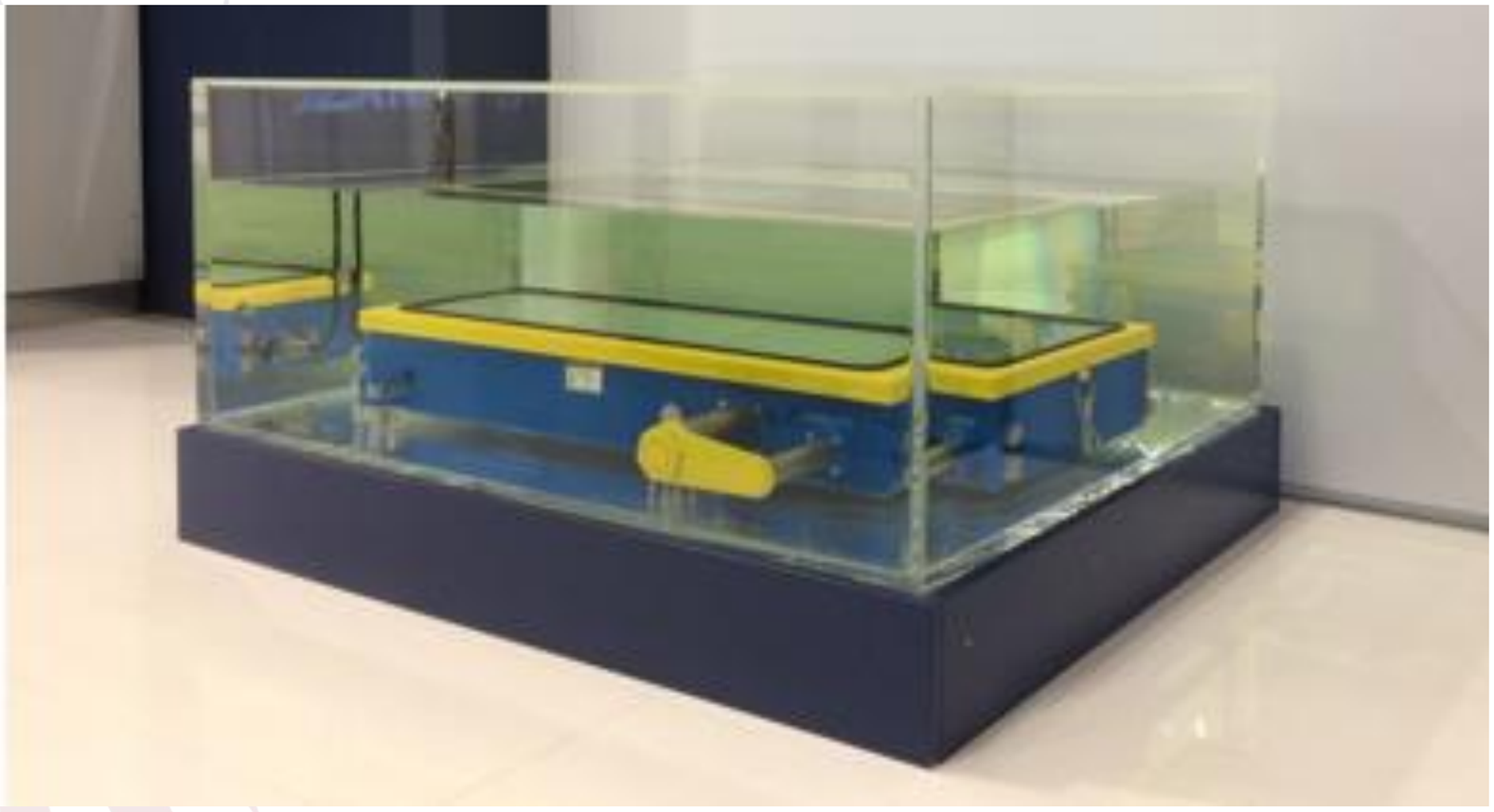
Resilience – Water (Ingress Protection (IP) 67 accredited)



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

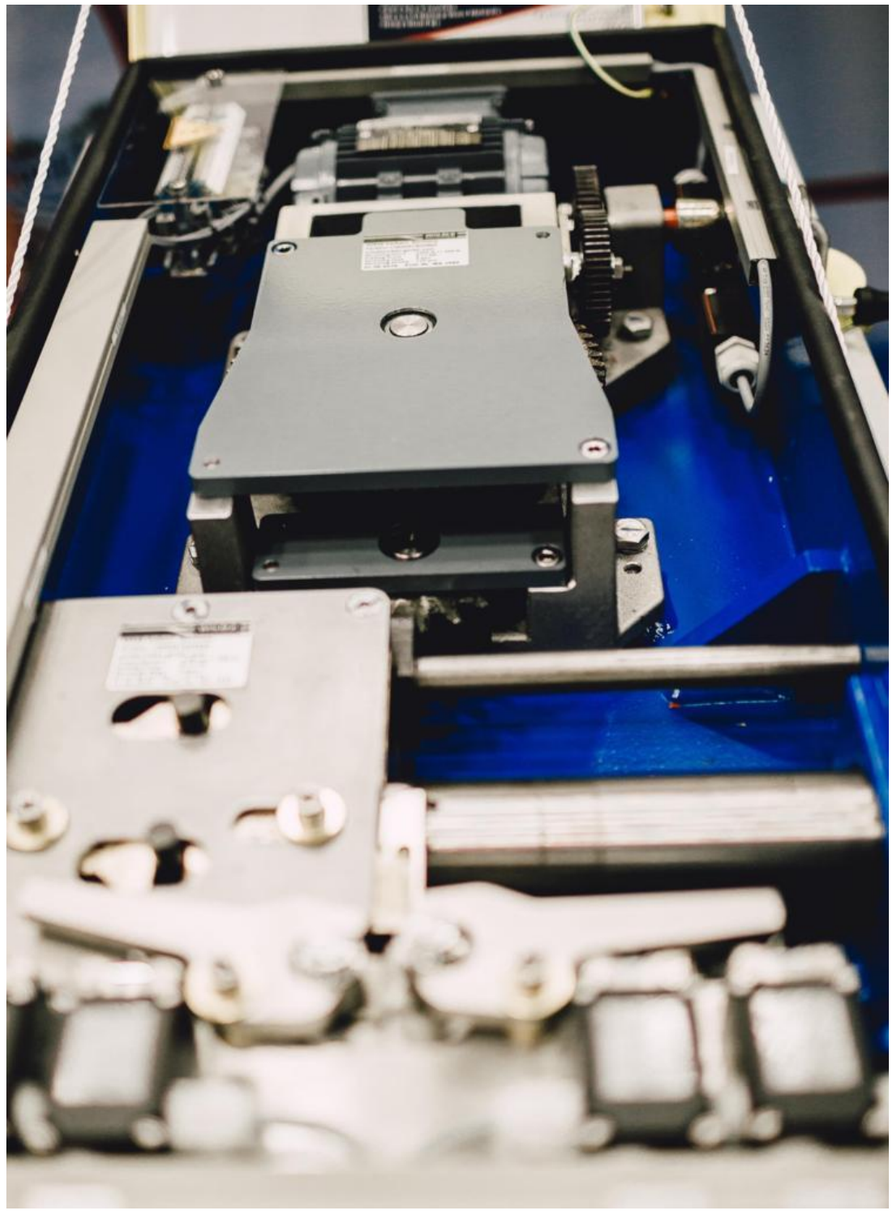
1. Does **not** contain hydraulic oil thereby eliminating oil leaks either in normal operation or when subjected to high volumes of water such as a flood, sea spray at a port or a harbour. Ideally suited to lines running adjacent to rivers, estuaries and/or the sea.

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.



Trailable Point Machine System (SIL-4 accredited)

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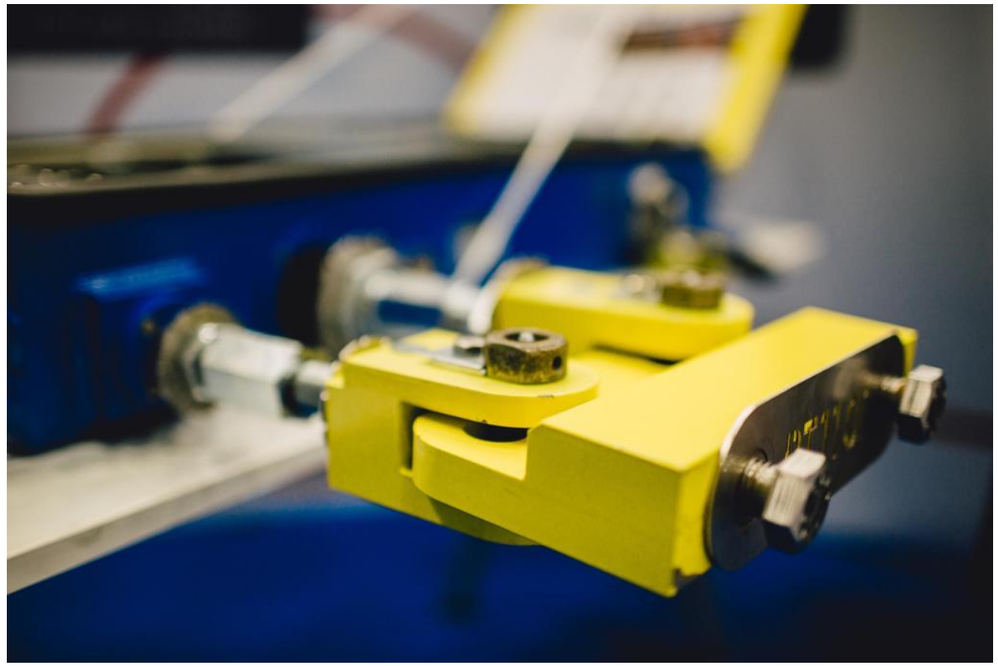
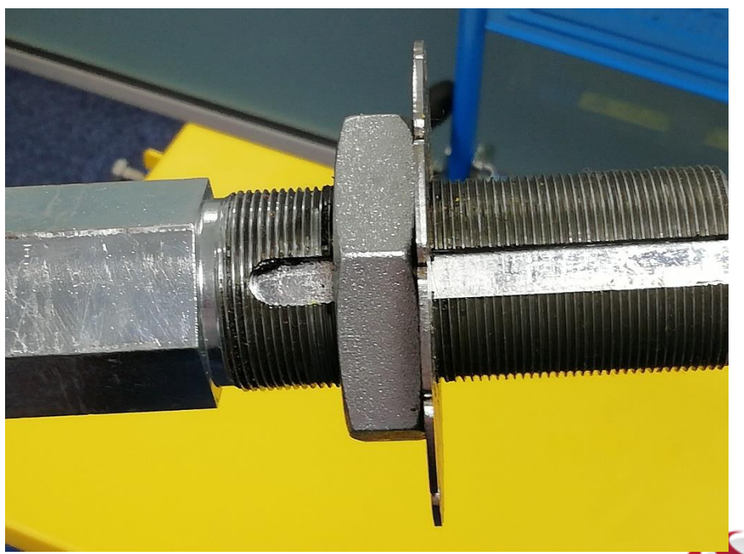
Compatible with most Track Gauges and any Rail Profile

Compatible with Track Gauges

Track Gauge (SI) (mm)	Track Gauge (Imperial) (feet, inches)
1,372	4 ft 6 in
1,435	4 ft 8 ½ 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 Arrangement

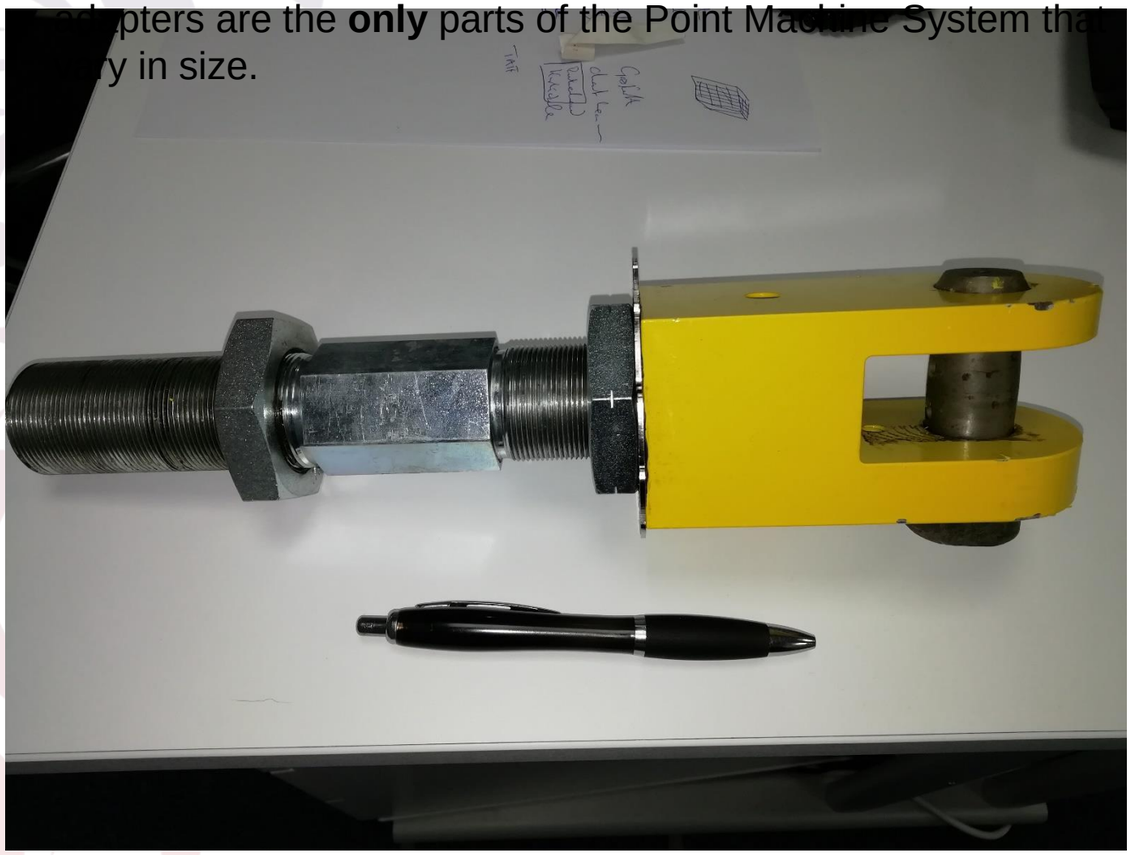
point machine – Switch Rail Adapter

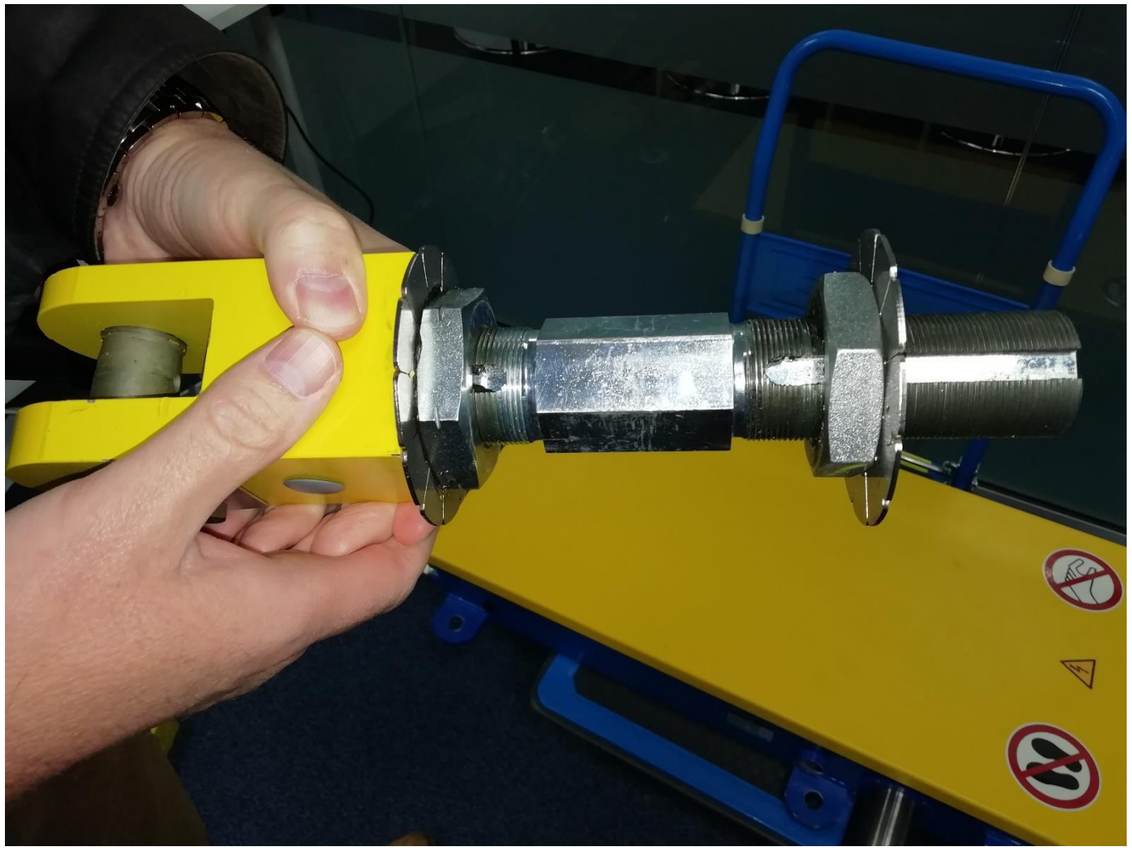
The Switch Rail Adapter is the main part of the Point Machine System that **changes to suit** the type of **rail profile** including CEN60, BS113, Bull Head, etc, etc.

point machines – Detection Rod Adapter

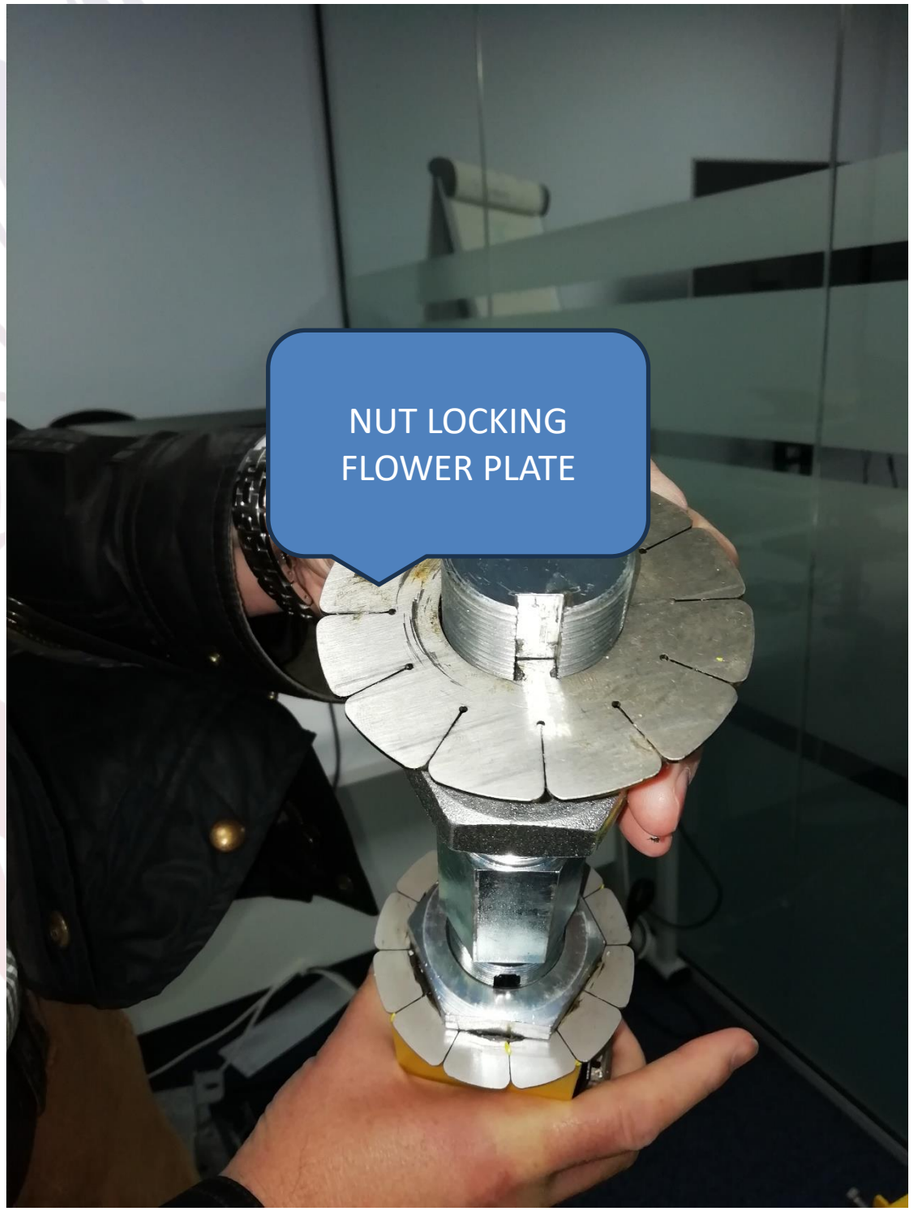
This Adapter **connects** the Detection Rod to the Switch Rail.

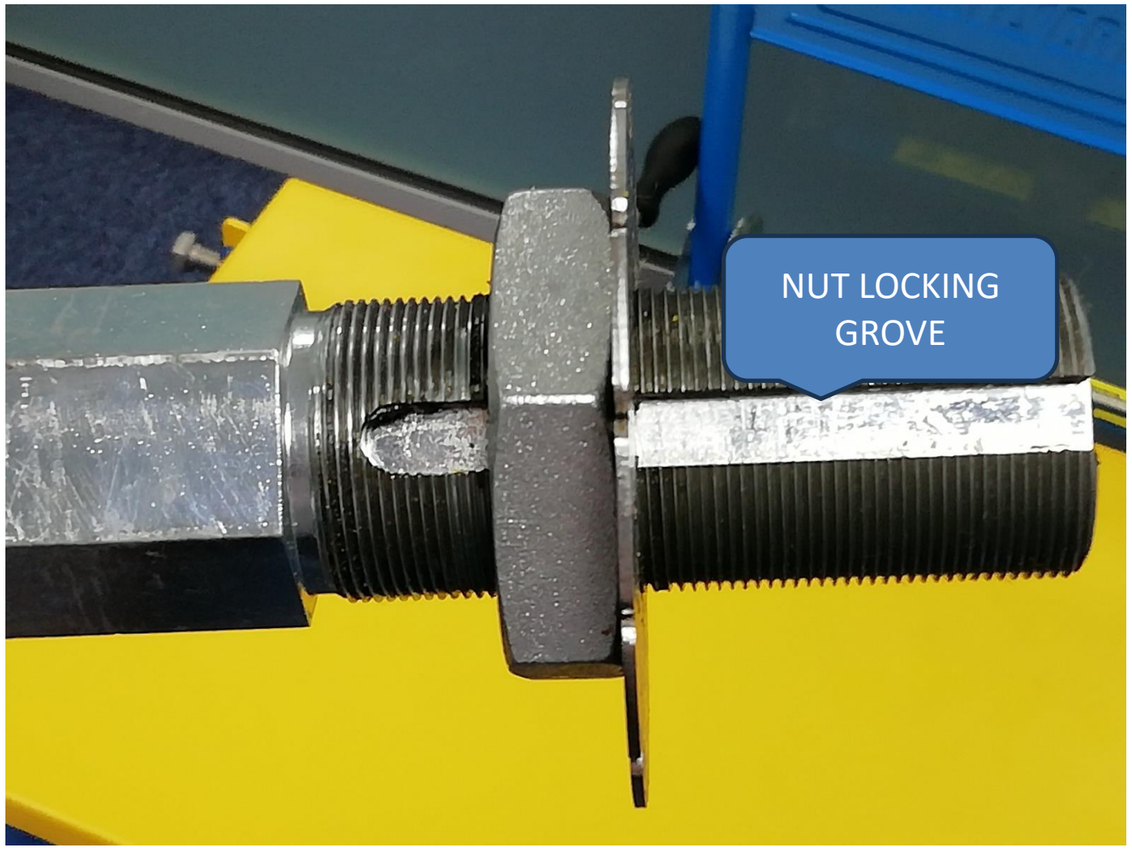
This means that only the detection rods and switch rail adapters are the **only** parts of the Point Machine System that vary in size.





point machine – Nut Locking Flower Plate



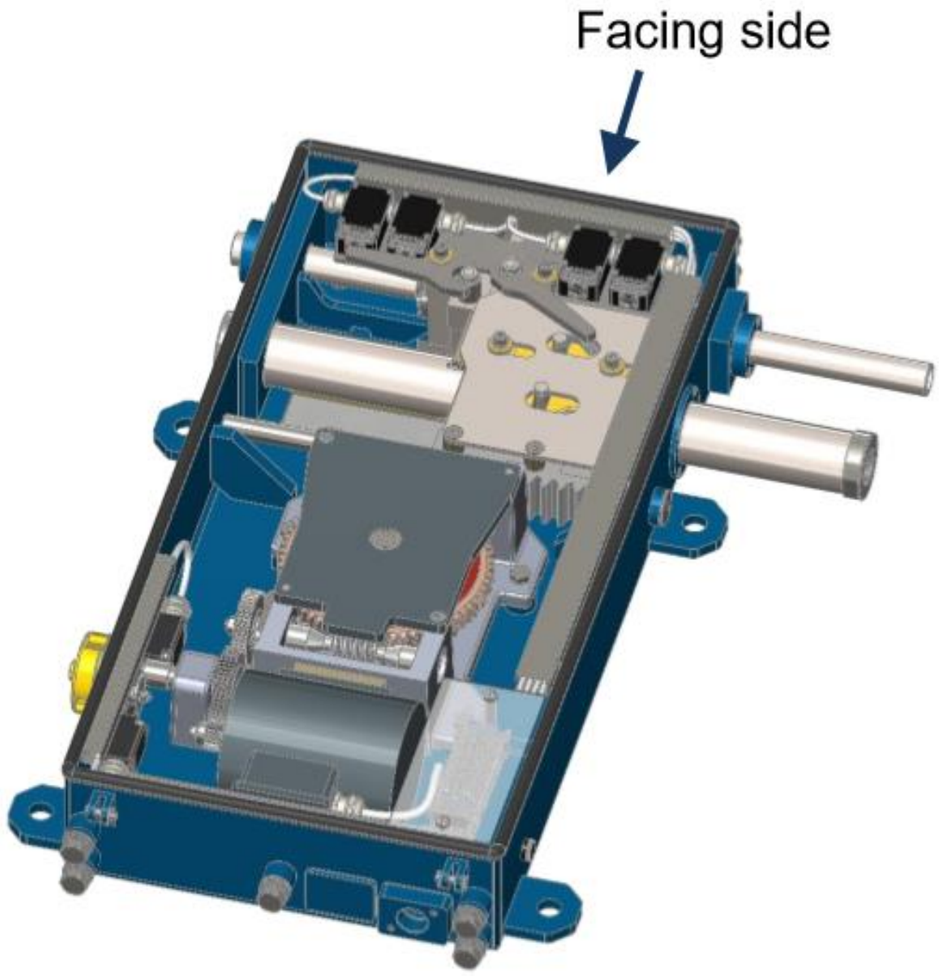


Once installed the ‘Nut Locking Flower’ plate is **bent** over and together with the locking groove **prevents** the locking nut from becoming freed by the vibration of passing rail traffic.

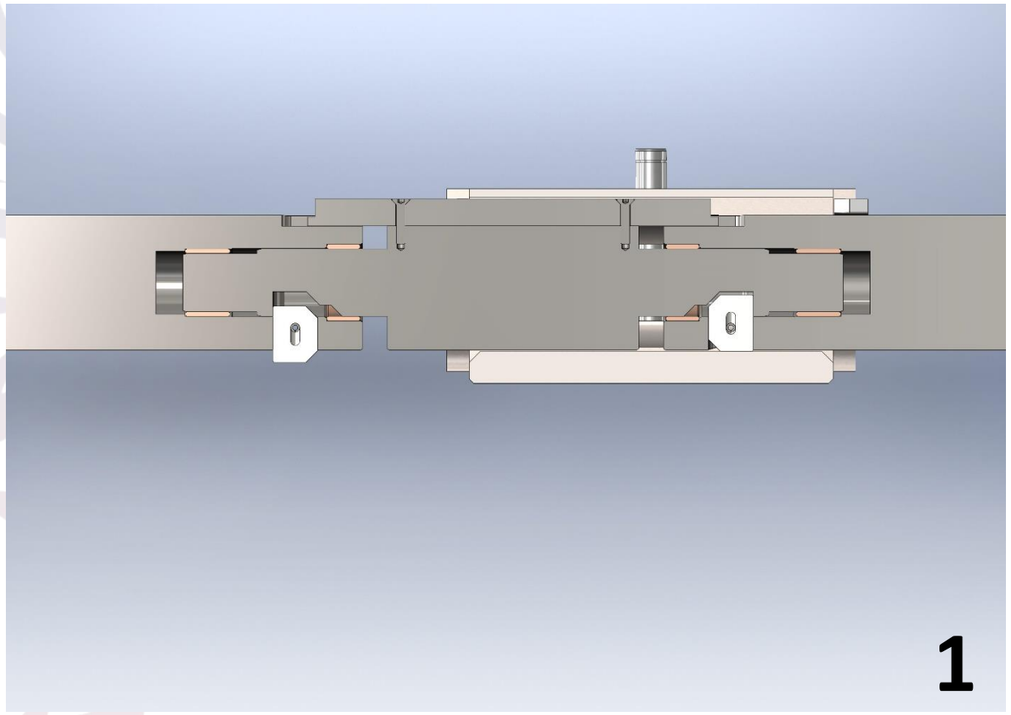
Available with a ‘Back Drive.’

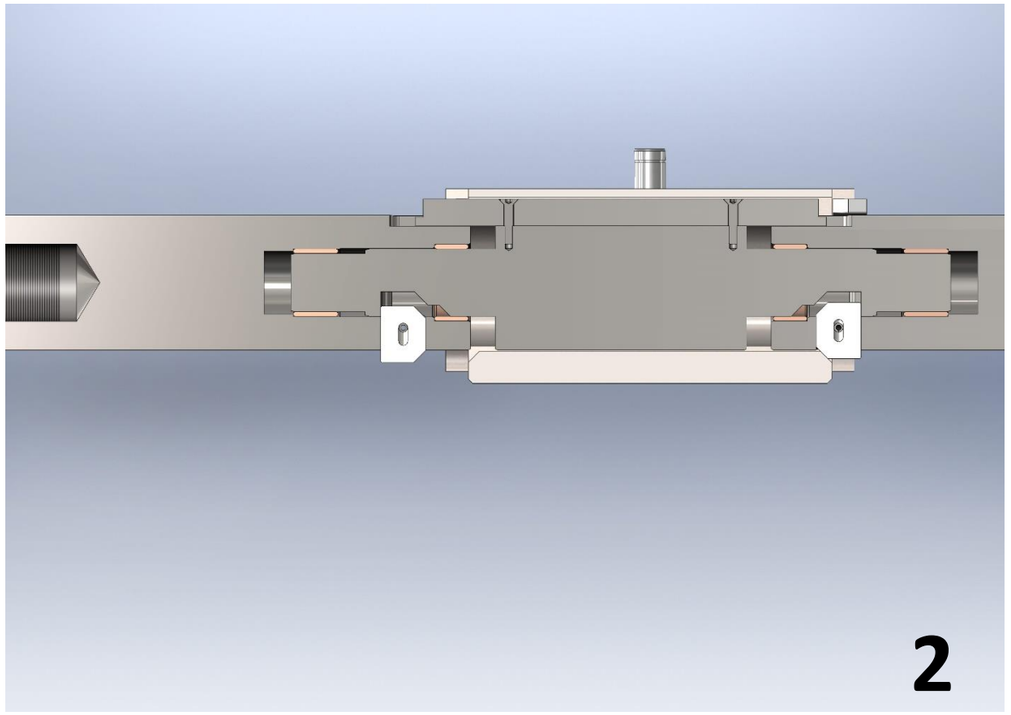
Trailable point machine system (SIL-4)

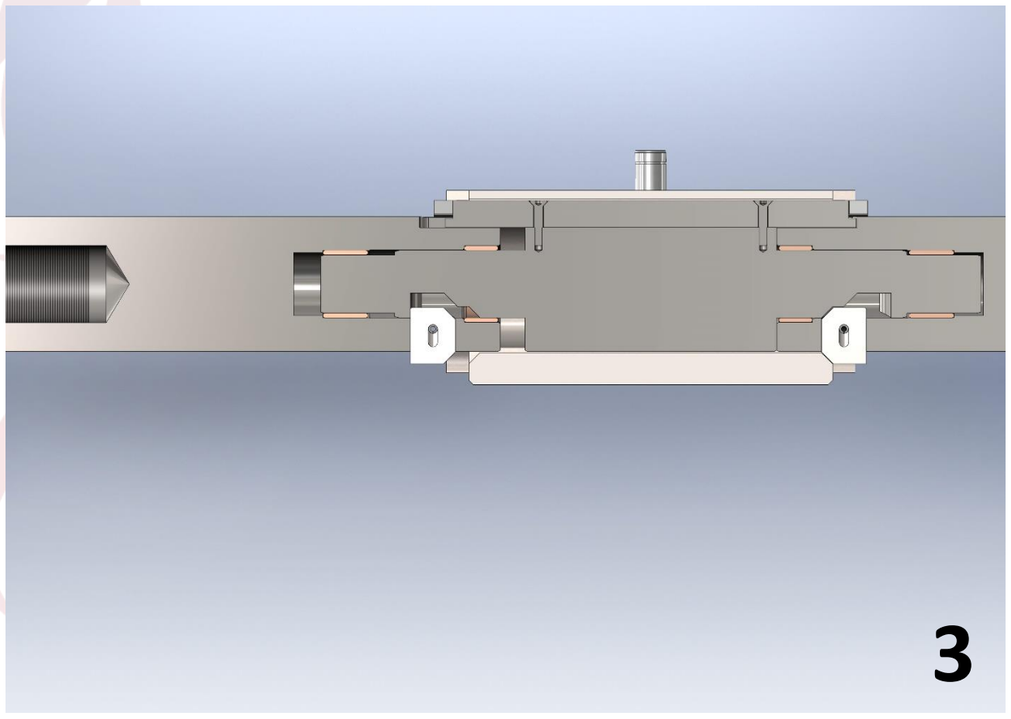
Facing point lock system
WA 110i-V – WA 160i-V

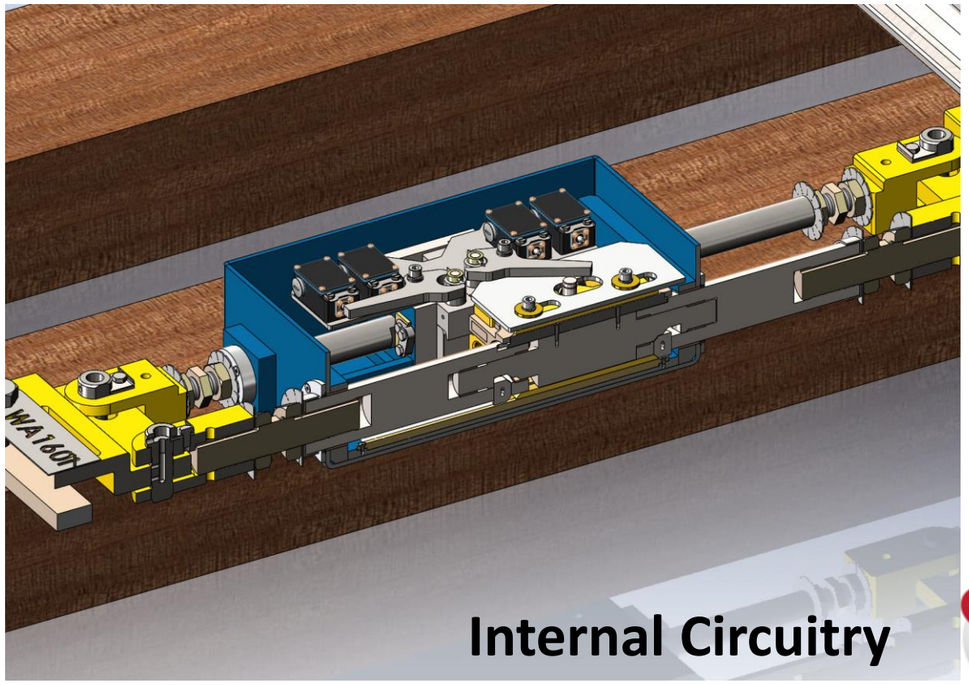


Point Machine System – inner workings









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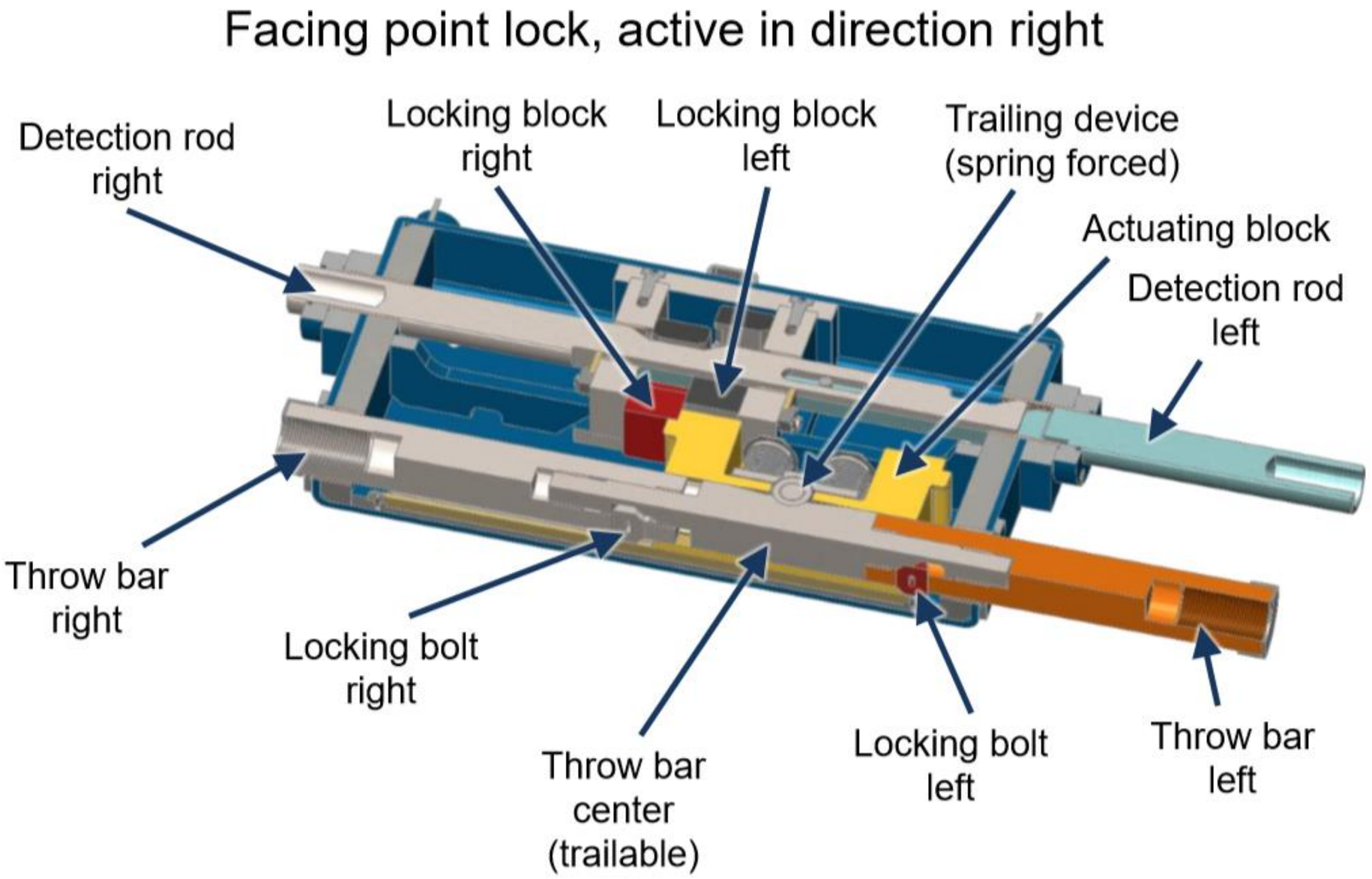
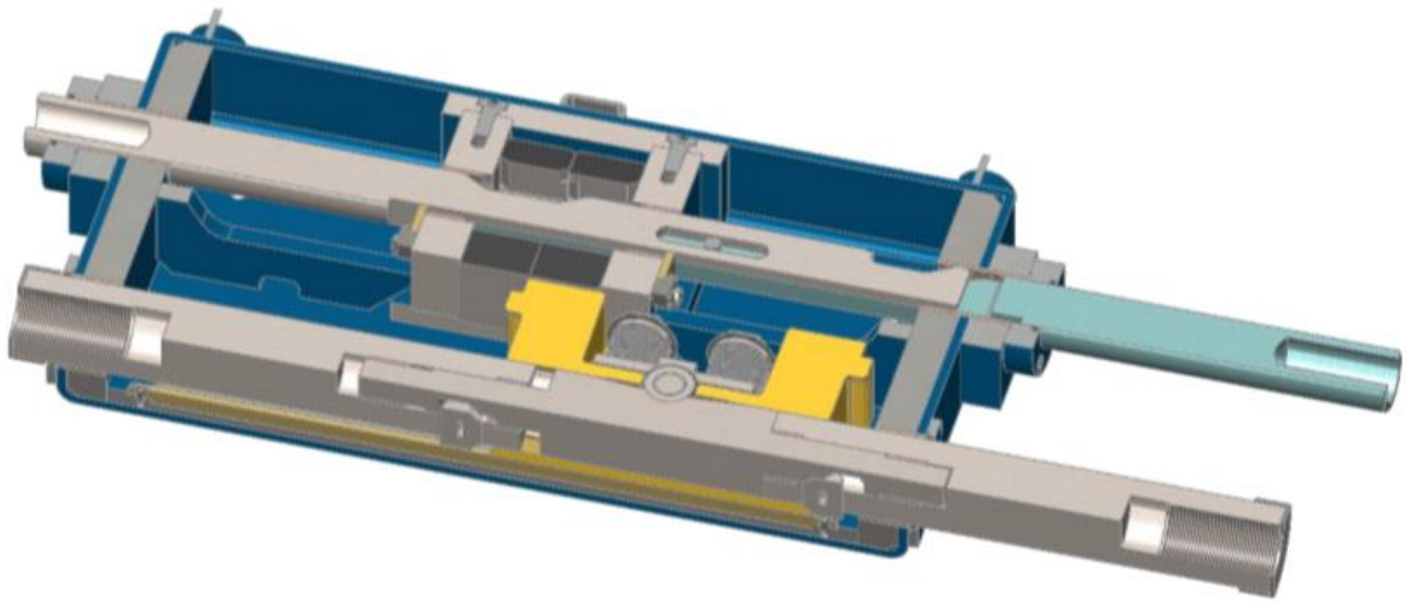
Operational sequence



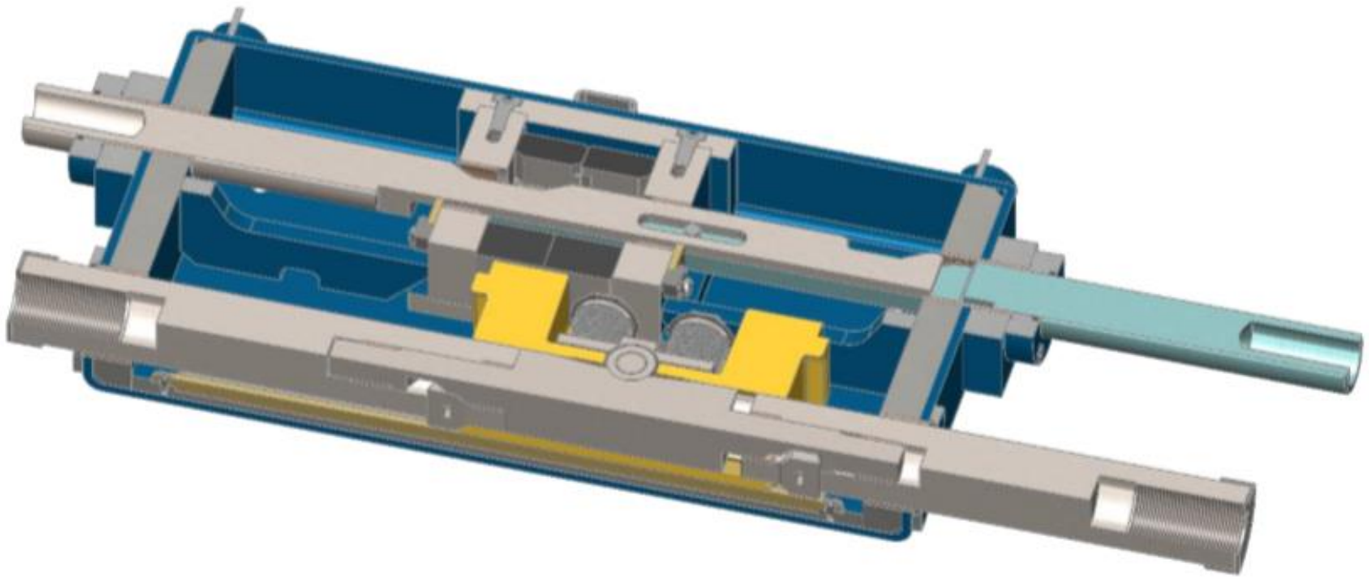
Operational sequence

Facing point unlocked in direction right



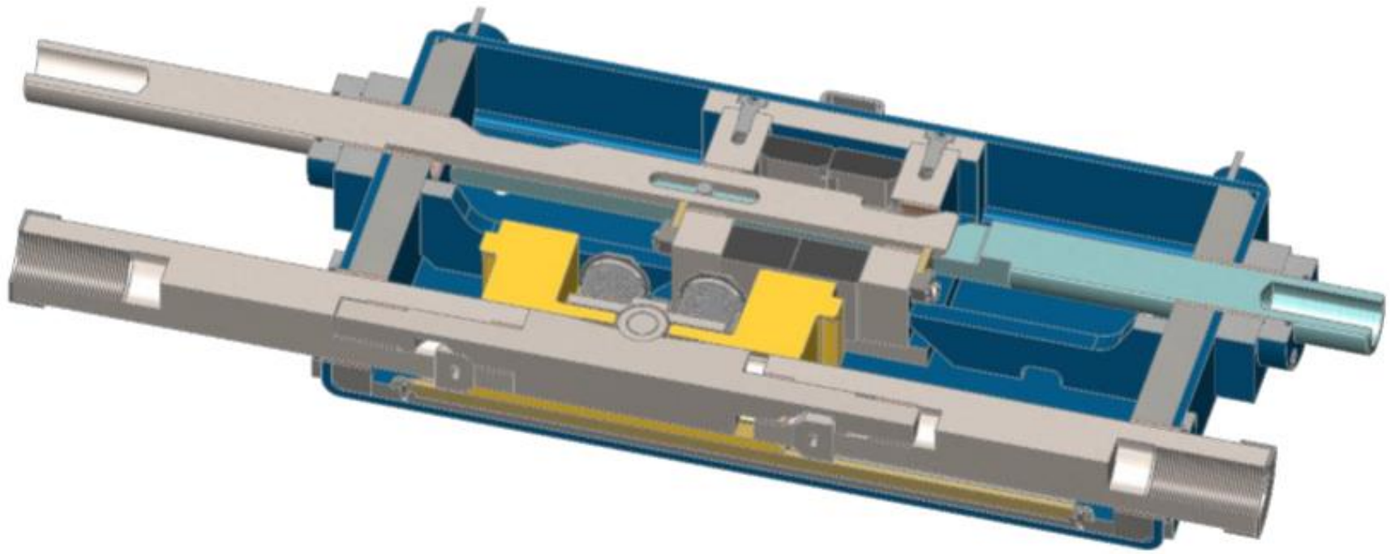
Operational sequence

Moving to from direction right to direction left



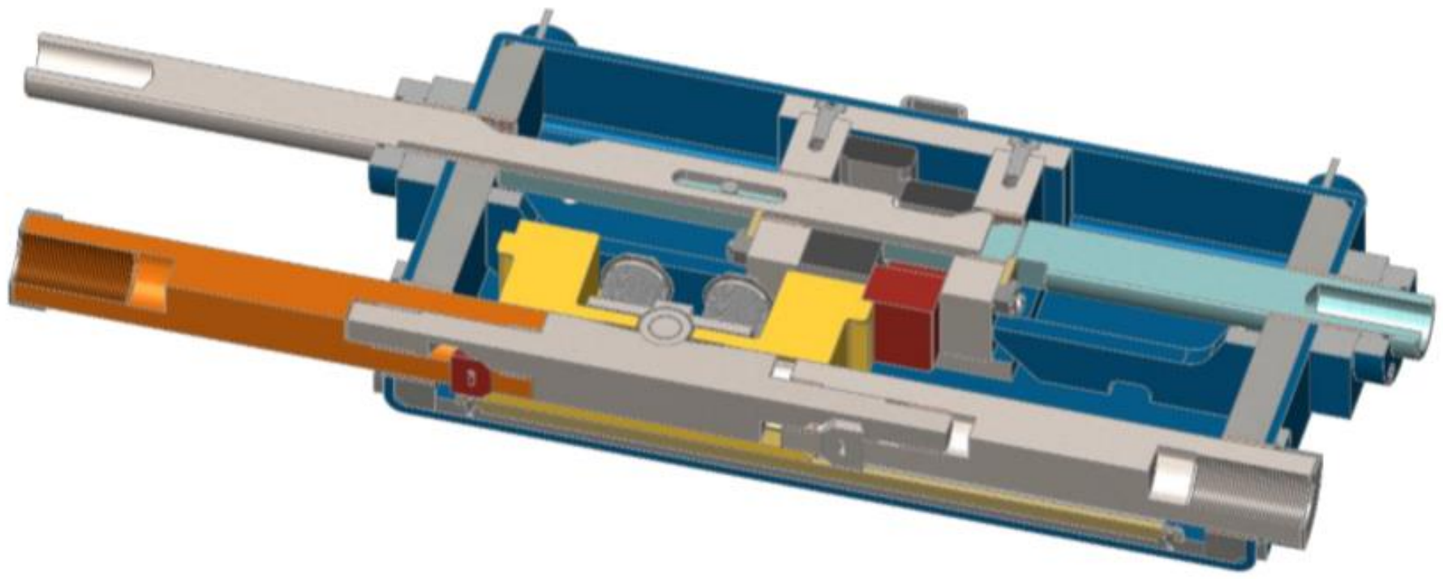
Operational sequence

Moving to from direction right to direction left



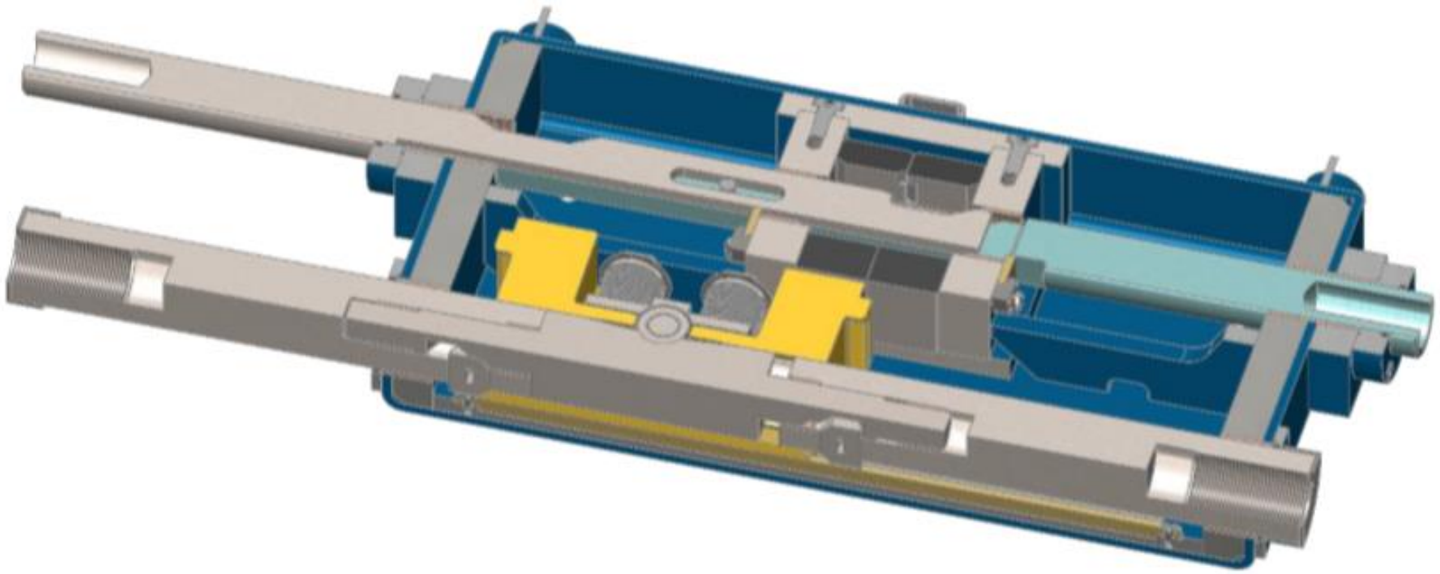
Operational sequence

Facing point lock, acitve in direction left



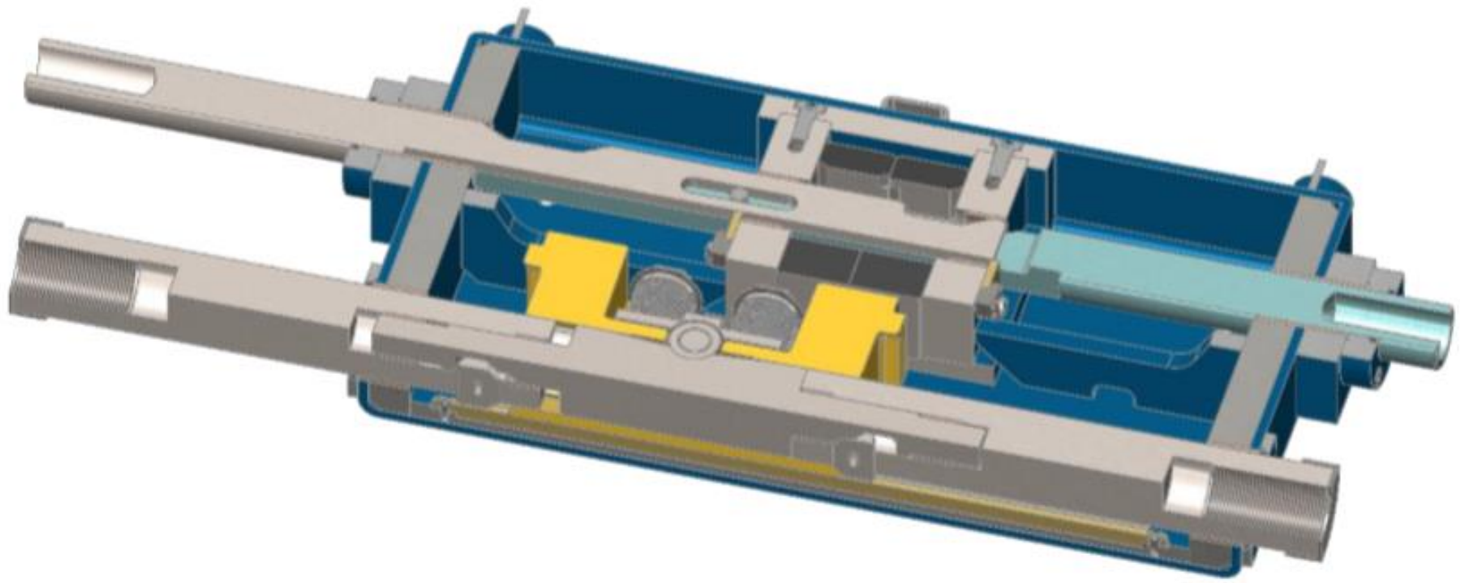
Operational sequence

Unlocked in direction left



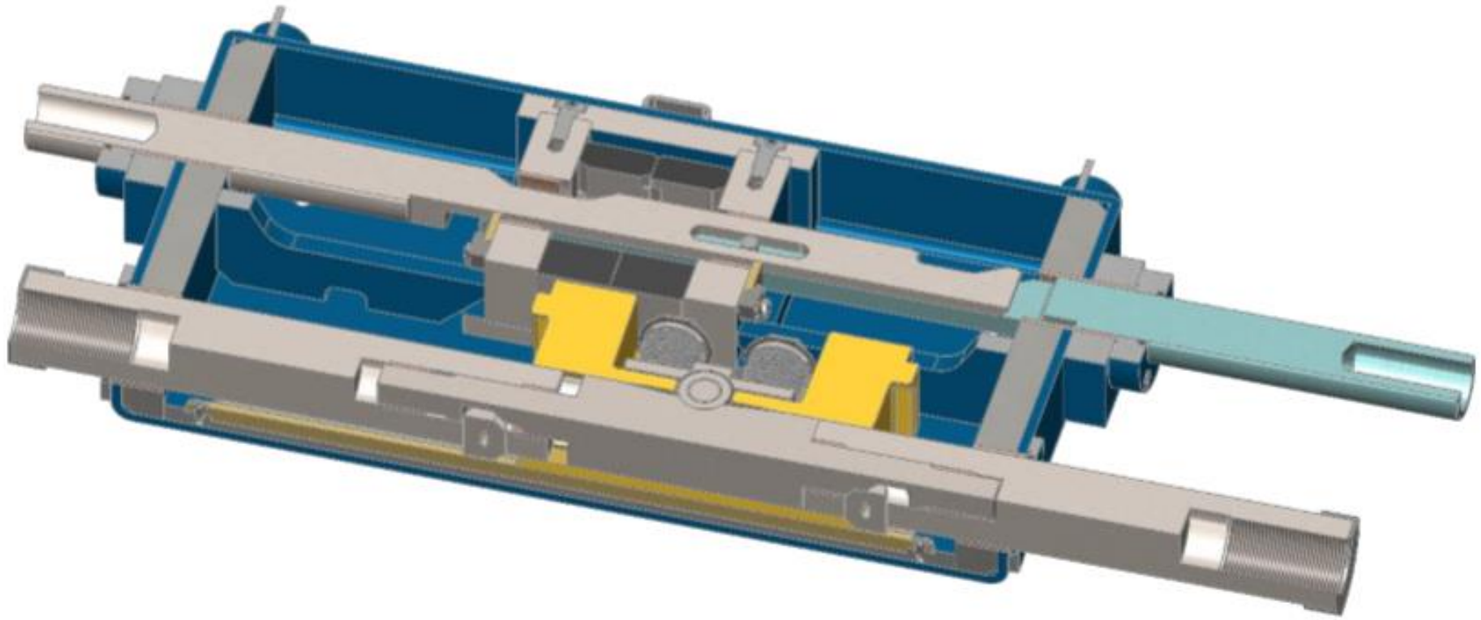
Operational sequence

Moving from direction left to direction right



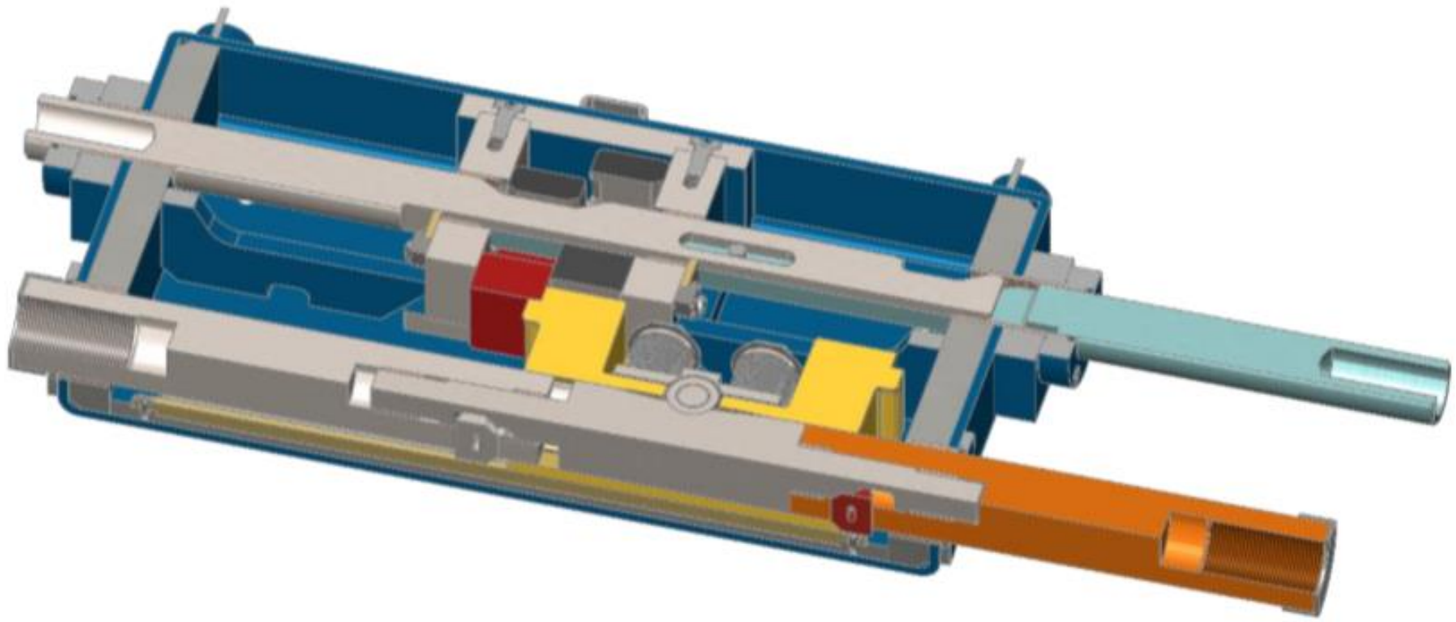
Operational sequence

Moving from direction left to direction right



Operational sequence

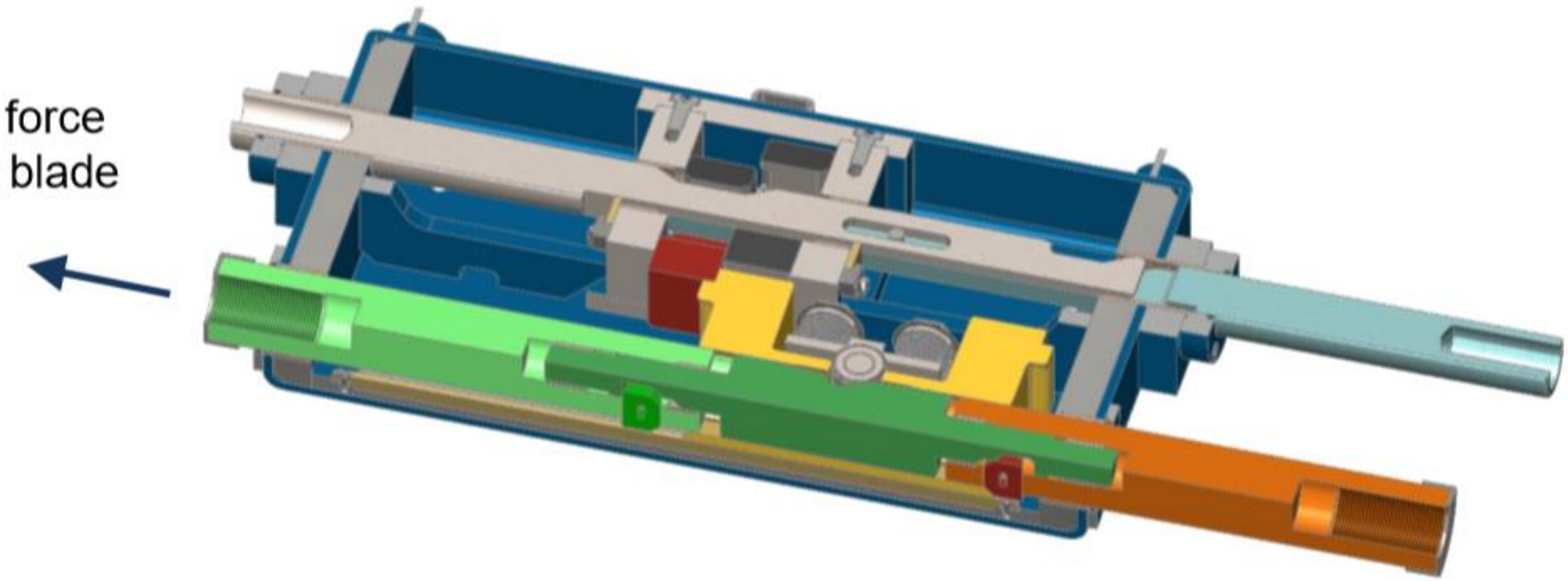
Facing point lock, active in direction right



Operational sequence

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

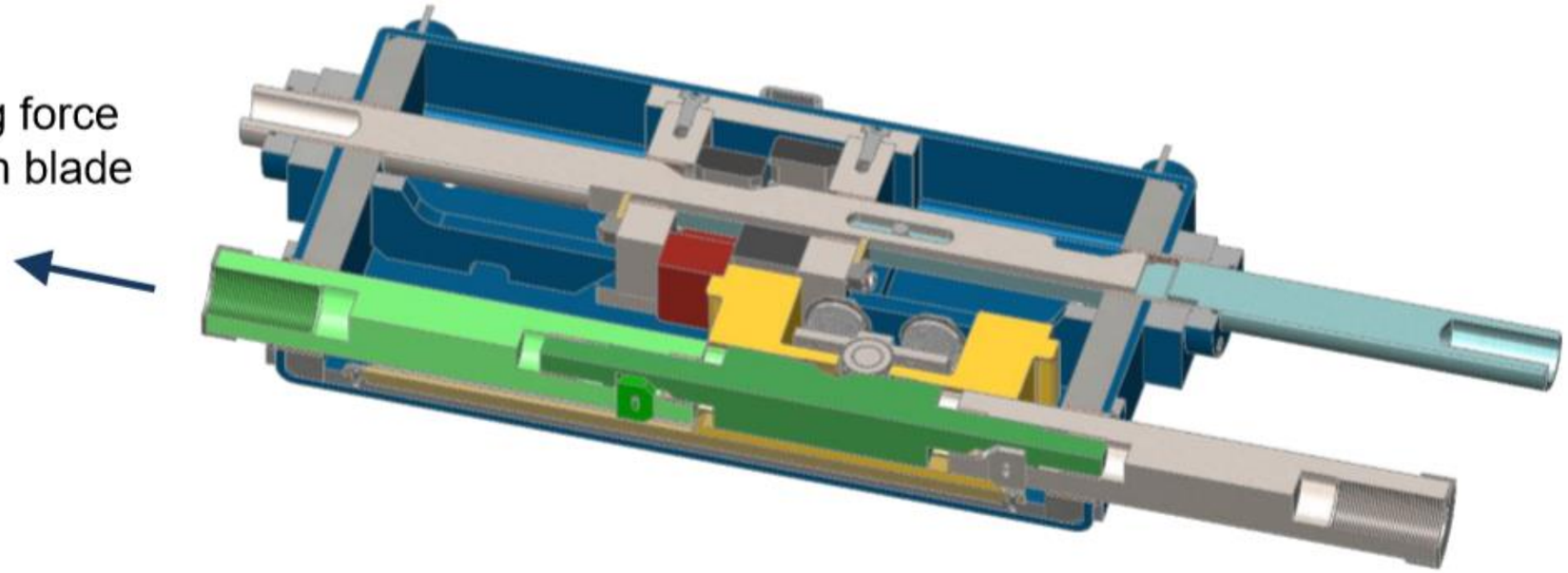
Trailing force
at open blade



Operational sequence

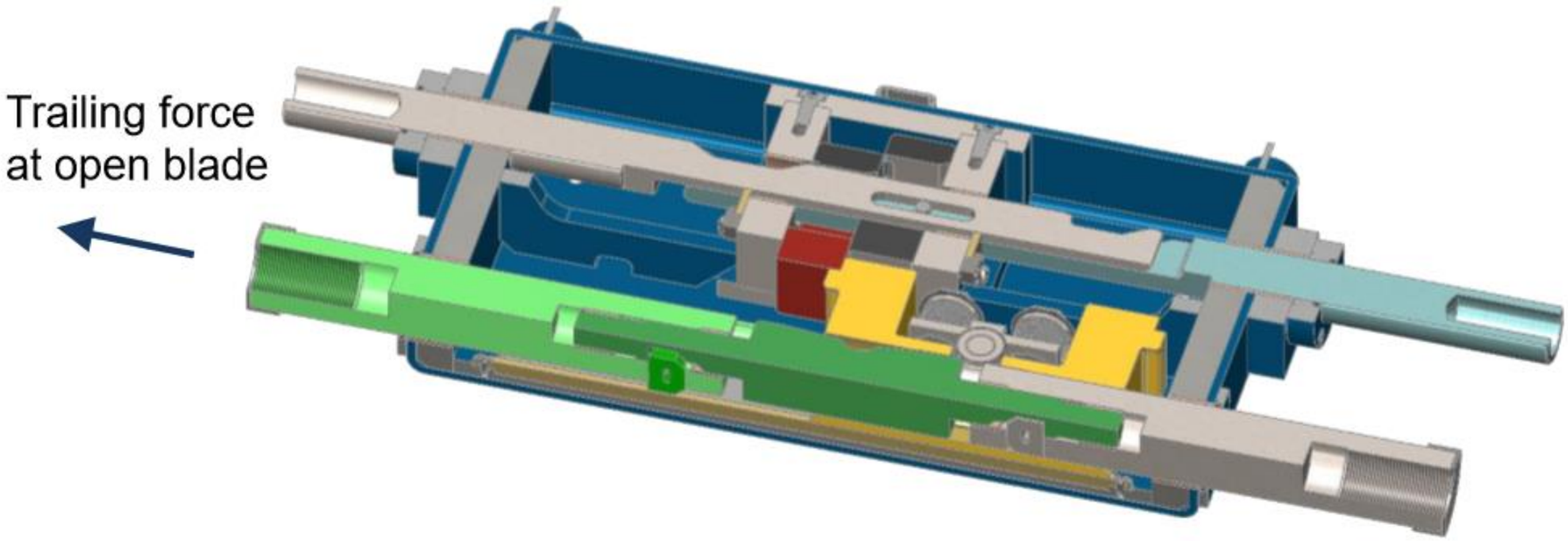
Trailing from direction right to direction left
Trailing to direction left, facing point lock open

Trailing force
at open blade



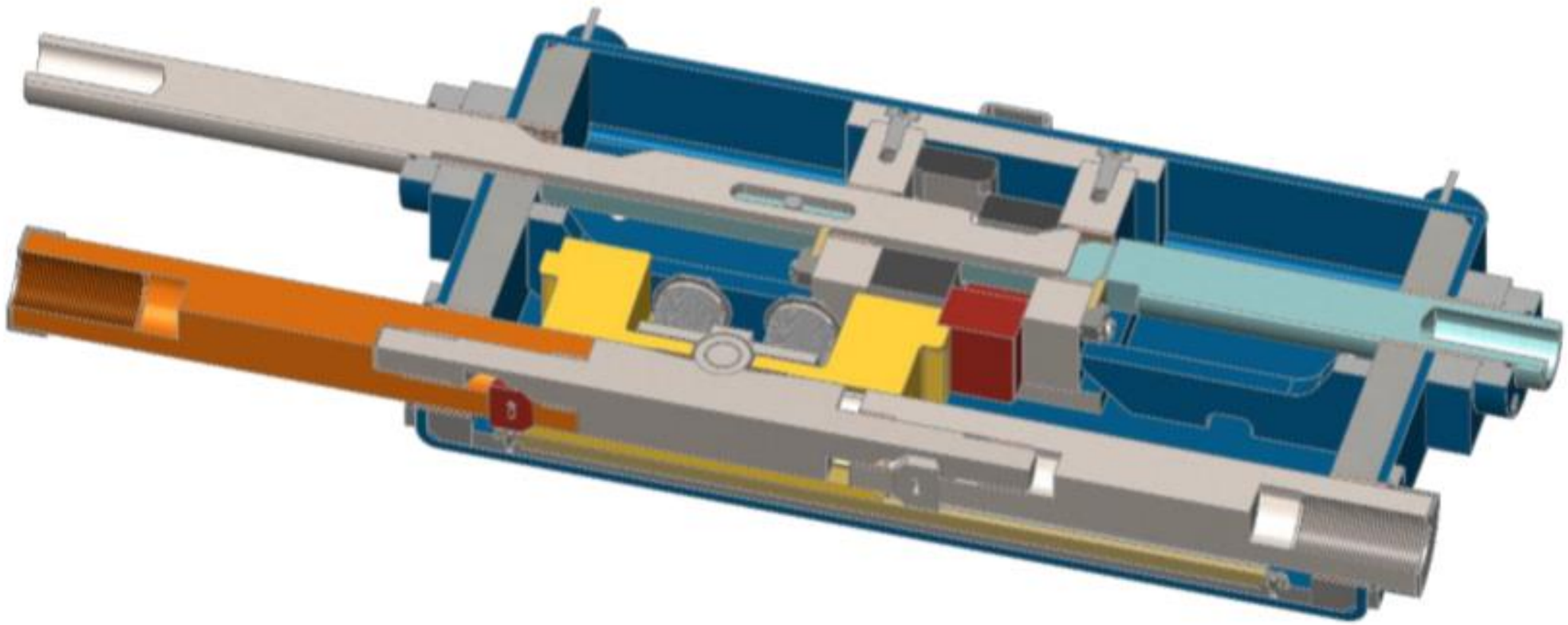
Operational sequence

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



Operational sequence

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



Key technical features.

1. **Trailable** point machine with in-built **facing lock**.
2. **Easy** to install.
3. **Minimal** maintenance.
4. **Light** weight - 110kg
5. Powered by 400V **or** 110V 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.**

a. **SIL-4** accredited.

b. A **value** for money solution.

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THANK YOU

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

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