A WS Group Company

tracksure

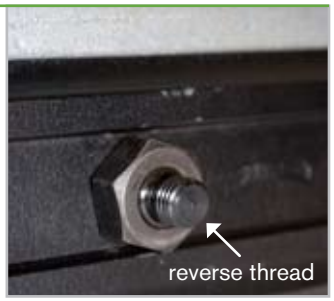
keeping safety on track

Tracksure market a unique range of patented nut locking devices that will prevent nut loosening as a result of vibration and settlement. The products, which can be used in a wide number of track and rolling stock applications, will enhance safety regimes and deliver cost and operational benefits.

The Tracksure Locking Device

The product is available in a large number of sizes and variants but broadly consists of three components, which are assembled as illustrated below

1.



The original bolt, modified with a reverse thread as indicated, complete with the original nut. **This is fitted and torqued in the approved manner**

2.

The Tracksure locking nut, complete with spring clip. **This is tightened, on the reverse thread until it meets the original nut**

3.

The Tracksure locking cover, serrated and in stainless steel. **This is pushed down over both the original nut and Tracksure nut, combining both pieces.**

Simplicity is the key

The product is simple and effective, resisting vibration loosening and settlement. In the event that the original nut starts to loosen, the Tracksure locking nut tightens against it underneath the stainless cover.

Our products can be re-used and serviced as necessary and require no specialist tools or equipment.

Expertise

This patented product has been developed from a wealth of knowledge and experience of bolt science and metallurgy. This core understanding of bolts and why vibration loosening happens has enabled us to engineer a solution that is not only technically sound but practical for industry.

A fuller examination of why bolts loosen under settlement and vibration can be found on p4, as well as on our website.

Tracksure-Enhancing Safety Regimes

Tracksure products are already enhancing safety regimes in a number of track applications throughout the world.

Braking Systems (as above) : Crossings : Anchor bolts : Breather switches: Tightly curved track : Fishplates & Insulated joints

The technology is also suitable for many other tough bolting challenges and can be developed for bespoke applications.

For each new application, the Tracksure service is driven by the need to ensure a practical and safe maintenance regime:

Initial consultancy, understanding the application and the problem

Project development & proving trial

Product familiarisation & training

Fitting and after sales support

A customer's view

> *"We first installed the Tracksure locking device in our braking system that is operating for handling cargo trains at the Rotterdam plant over 12 months ago. Since then we have not had any incidences of bolt loosening and this represents a major benefit to us both practically and economically"*

Sven Bossers, ProRail Maintenance Engineer

tracksure

Tracksure-Delivering Cost & Operational Benefits

Managing a safe and cost-effective rail infrastructure are the twin objectives of rail management companies world wide–whether privately owned businesses or state owned enterprises.

Tracksure products directly deliver against both objectives in the ways described below:

- Eliminating “constant monitoring of previously suspect joints”
- Eliminating regular re-torquing of previously loose joints
- Eliminating the “hidden cost” of regularly replaced bolts/nuts
- Reducing secondary damage caused by loose joints
- Reducing consequential damage (derailments/fines/closures) caused by insecure joints
- Reducing the cost of specialist equipment required to replace some loose joints
- Allowing specialist manpower to be re-invested elsewhere in the network for proactive maintenance

Tracksure-Award Winning Products

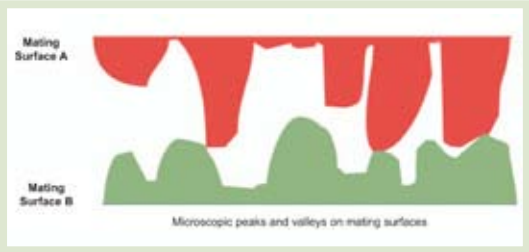
- **Winner -European Innovation Award- Railtech ® Utrecht 2007**
- **Commended-Railway Industry Association Awards (Engineering & Safety)-2008**

We are very proud of these awards which recognise the ingenuity of our product. They come on top of a similar group of awards for our Wheelsure range of products and lend weight to the practical performance of our products.

Settlement, Vibration and nut-loosening

Settlement and Vibration lead directly to nut loosening which can affect many track and rolling stock applications, including insulated joints, breather switches, temporary clamps, turnouts and retarder systems

Settlement



Settlement is where mating surfaces, which appear to be tightly clamped together, become loose with the effects of lateral or vertical movement, impacts, changes in temperature or other causes. Under a microscope it is possible to see two mating surfaces (surface A and B) clamped together as illustrated below. The two surfaces are in fact made up of many peaks and troughs with only certain areas in direct contact. When settlement occurs these peaks are no longer in contact and the joint is no longer held fast. It is also a fact that when there are two components to be bolted together there are multiple mating surfaces (between components, between bolt and components, between nut and components and between thread and nuts and bolts) and settlement can affect any of these mating surfaces.

Vibration

Vibration loosening occurs when bolted joints are not adequately held together by clamping force. This can be as a direct result of settlement and/or any of these reasons in combination with settlement.

The tensile load potential

In many rail applications the correct tensile load potential of the bolt cannot be applied. For example, if the bolts in a fishplate were tightened to their full potential, there would be consequential damage to the rail. Because of this the fishplate bolts are unable to resist vibration loosening.

Application of torque

In many rail applications torque is applied using a non-calibrated wrench. Under these circumstances, torque is inconsistently applied and it is impossible to know whether the true potential of the bolt is being realised.

Age and condition of the fastener

As the bolts become damaged or corroded the torque energy used to tighten them will not efficiently transfer into clamp force. It is clamp force that keeps the joint tight. Even with brand new nuts and bolts which are correctly torqued, only a small percentage will develop clamp force, with the rest overcoming frictional resistance in the threads.

Human error

Maintenance resource is always scarce and therefore under pressure. The problems of vibration nut loosening and settlement, either singly or together, make the maintenance of bolted assemblies very onerous. The lack of fail-safe systems leaves infrastructure managers open to the plain fact that one mistake can have devastating consequences.

Any combination of the above can give rise to that particular joint failing to perform the task it is intended for. The consequences of this can range through unnecessary rail damage to derailments and worse. Vibration nut loosening is graphically illustrated under test conditions on the Tracksure website.

Tracksure Limited, 8 Woburn Street, Ampthill, Bedfordshire, UK , MK45 2HP
+44 1525 840557 sales@tracksure.co.uk www.tracksure.co.uk