

Self-locking bolts can cut track inspections

INNOVATION Approved or on test in several countries, the Tracksure Locking Device offers potentially significant savings in infrastructure maintenance costs, as well as reducing accident risk.



Left: CSX has used Tracksure to secure retarder brake pads in one of its hump yards.

loss of clamping force, such vibrations can also lead to fatigue.

Most safety-critical bolts used in track are fitted with lock nuts, but this does not always prevent the onset of vibration. Regular checking of the fastenings generally means manual inspection, which is becoming more dangerous and difficult to schedule as capacity on key routes becomes scarce. In recent years infrastructure managers have been investigating many different ways to flag up loose bolts, using painted marks or clip-on indicators, for example.

Opposing threads

Given these pressures, the Tracksure Locking Device attracted considerable interest when it was shown at the Railtex trade fair in London on June 13-15. The locking arrangement is designed to prevent the main fastening nut from unintentional loosening, yet can be removed quickly and easily when necessary. Tracksure bolts do not need expensive equipment to install, and offer potentially significant savings in maintenance costs.

Tracksure has been developed by the WS Group, which was founded in 2003 and supplies similar fastenings to the automotive sector under the Wheelsure brand. Chief Executive Gerhard Dodl says the original application was developed to address a growing number of failures of bolted axle assemblies on road vehicles, but the concept offered clear benefits in the rail sector as well.

The locking arrangement works by using a slightly longer bolt, which otherwise meets the regular metallurgical and dimensional standards. The end of the bolt is modified with a counter-threaded section to a slightly smaller diameter, so that the locking device rotates in the opposite direction to the main nut.

When the bolt is installed, the main




Hungarian state railway MÁV is using Tracksure fastenings to secure turnout crossings.

nut is tightened to the correct torque using a calibrated tool as usual, before the locking device is run up to it on the second thread. The two nuts are then covered and locked together using a push-fit serrated cap. This is secured using a spring clip in a groove on the locking device, so that it is retained in place yet can be pulled off easily by hand if necessary.

In the event of any vibration starting to turn the main nut, the serrated cap will turn the locking device at the same time, but in the opposite direction, ensuring that the bolt retains the correct torque and clamping force.

World-wide application

The technology is already on test with a number of infrastructure managers around the world, notably CSX and CN in North America and Ferrovienord in Italy. In the Netherlands, ProRail is using Tracksure bolts to secure the retarder brakes in a major marshalling yard. The device has recently been approved for use on crossings in Hungary following trials which demonstrated both a safety benefit and substantial savings, and tests in Spain have also started.

More than 4 500 Tracksure bolts are now in use on London Underground, following the award of formal 'approved for use' status in September 2010; the system had previously been trialled by LU at four locations over two years. However, Dodl regrets that it has not yet been possible to negotiate a trial with Network Rail. 



The serrated cap locks together two nuts which turn in opposite directions.