



TT Club Loss Prevention

July 2024

Supply chain security bulletin

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Container and Trailer Sealing
A New Threat to Shippers: Sophisticated Security Breach in Cargo Transportation
The Use of E-seals

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Supply chain security bulletin

This bulletin considers all aspects of supply chain security, highlighting TT Club claims statistics along with a range of other industry data providing an invaluable insight into the current risks facing those tasked with managing security through the supply chain. The Club has produced a number of reports and guidance documents related to this area of risk across numerous media platforms.

This bulletin will gather a selection of TT content and publications as well as highlighting collaborative work undertaken with other like-minded organisations in this space.

The entire library of TT's loss prevention guidance can be found at www.ttclub.com/loss-prevention and you are invited to email us at riskmanagement@ttclub.com or get in touch with your usual contact should you have any queries, ideas or suggestions.

Foreword

Incidents of cargo theft globally continue to pose a threat to the supply chain. TT have identified further spikes in activity in the United States and Italy in the last months, continuing trends from the 2023 data shared in the last edition of the bulletin.

In this edition we go back to basics and focus on one of the fundamental risk management tools available to manage not only security but the integrity of cargo through the supply chain – the security seal. Readers will no doubt be familiar with the range of security seals currently available, from basic plastic clip seals through to the more frequently used bolt seals where containerised shipments are concerned.

Each have their merits and purpose. While most seals don't pose a robust barrier to entry, identifying tampering can be vital insofar as liability is concerned, identifying exactly how, who was involved and where the goods were stolen.

As with most security measures, thieves have developed sophisticated counter strategies, from recruiting insiders to ensure that a bolt seal is not fully engaged at the point of loading, manipulating the seal numbers, through to 3D printing almost identical seals that can be affixed once the cargo is stolen.

Often personnel at the receiving warehouse view the seal as a nuisance, something that needs to be cut from the doors prior to them opening the trailer or container and fulfilling their role of unpacking. It would not be uncommon at receiving warehouses to see security seals discarded in the yard area or in refuse bins near the dock doors. It remains good practice however to closely inspect the security seal for tampering, prior to cutting it from the cargo transport unit, as well as to check the seal number against the number recorded on the transport documents to ensure they match. Finally, it is also best practice to retain the security seal; if an allegation is later raised or it becomes evident on unpacking that cargo is missing, the security seal could provide useful evidence to defend a claim and ensure that the liable party is duly identified.



Container and Trailer Sealing

In an increasingly globalized world, the transportation of goods across vast distances has become commonplace. Cargo security and integrity remains a top concern for shippers, carriers and logistics professionals alike. This article discusses the application of security seals on trailers and shipping containers, a critical yet often overlooked aspect of the global supply chain. It will explore the types of security seals in use, their effectiveness, and the role they play in preventing tampering and theft.

Security seals are ubiquitous in the world of logistics and transportation, yet their importance is often underestimated. These small devices, typically made of plastic or metal, are affixed to the doors of trailers and shipping containers to provide a first line of defence against unauthorized access. Their prevalence in the industry is such that they often go unnoticed until the absence of a seal is highlighted by customs or border control. Despite their importance for ensuring cargo integrity and preventing unauthorised access, many sites exert surprisingly limited control over the application and monitoring of seals. The processes that govern these security measures are often minimal or non-existent. In order to understand why this is important, it is first important to understand the ways in which the integrity of seals and loads can be compromised.

Types of seals used

There are several types of seals in common usage.

- **Bolt Seals:** These are high-security seals, typically used for securing shipping containers. They consist of a metal rod, or bolt, which is inserted into a separate metal locking body component to form a closed loop. The bolt is secured inside the locking body by a ring that does not release once the bolt fits through it. Bolt seals are single use as they must be removed by cutting with bolt cutters.
- **Cable Seals:** These seals are flexible and versatile, made from a length of cable that is threaded through the fastening point and then locked into place. These are also typically single use seals.
- **Plastic Seals:** These are often used for sealing bags, tote boxes, or other containers that don't require a high level of security. They are typically single-use and must be cut to be removed.
- **Metal Strap Seals:** These are durable seals made from a length of flat metal that is bent into a loop and secured by a locking mechanism. They are easily cut and removed and are only marginally more secure than plastic seals.
- **Padlock Seals:** These are similar to traditional padlocks but are single-use and have a unique identification number. They are often used for securing doors or gates.
- **Electronic Seals:** These high-tech seals use electronic mechanisms to detect and record when a seal has been tampered with or removed. Newer technologies may include GPS tracking and notification of security breaches.

Each type of seal has its own strengths and is suited to different applications, but all serve the same basic purpose: to provide a visible indication of tampering and help secure goods in transit. By far the most common type of seal used for sealing containers is the bolt seal. Although it may appear robust, this type of seal has several known vulnerabilities.

Compromised seals

The compromise of bolt seals can be achieved through various methods but most are attempts to compromise seals by enabling

single use seals to unseal and reseal. In cases where a seal has been unsealed and resealed, cargo may appear to be secure even when it is not. This enables cargo theft or the introduction of clandestine migrants or illicit goods without raising suspicion. It is important to know how to spot the warning signs of a compromised seal in order to prevent trafficking and to uncover cargo theft promptly.

One common method of compromise involves using a cutting tool to slice along the casting mark of the locking body of the seal, which facilitates the disassembly of the casing around the locking body. Once inside the casing, the snap ring that secures the bolt may be tampered with, enabling the bolt to release from the locking body. The casing can then be reassembled using adhesive. If executed proficiently, the reattached casing may appear identical to an uncompromised seal. To test whether the casing has been tampered, use bolt cutters to cut into the casing. If the seal is uncompromised, then the casing will crimp as the lock is cut. If the casing separates along the casting seam, this indicates potential tampering and further investigation may be warranted.

Bolt seals may be modified in other ways to enable unsealing and resealing. The head of the seal bolt and the locking body can be threaded to enable the bolt to screw on and off. Alternatively, the end of the bolt can be filed down, allowing it to be pulled out of the snap ring and reused. Tests for these types of compromise are simple. Attempting to pull or unscrew the bolt from the locking body should reveal whether these methods have been used to compromise the seal.

It is also important to visually inspect the seal for any sign of tampering. This may include drill marks or file marks, which may be a clue that the seal number has been altered. Examination of the seal number may reveal irregularities in spacing between the numbers, the alignment of the numbers, or of the margins between the number and the edge of the seal. Any of these may indicate that the original number has been filed off and a new number stamped in its place. Knowing what an uncompromised seal looks like may be very helpful in identifying a compromised seal and it is recommended to keep examples of seals on-hand for the purpose of comparison.

Bypassing seals

Although sealing is important for ensuring the integrity of cargo and cargo units, it is important to note that it is possible to open a container's doors while leaving the bolt seal intact. The locking hardware of a container comprises several components, each playing a crucial role in maintaining security. By cutting through rivets or through the locking components themselves, the security of the container may be bypassed while leaving the seal intact. Using threaded rivets and welding cuts, intruders are able to hide their activity. It is important to remain vigilant and aware of signs of tampering to the container locking mechanisms. In particular, signs of wear or tool marks on the retaining flap (which keeps the left door closed while the right door is locked and sealed) may indicate that the doors have been forced open.

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Seal culture

Sealing containers is required by most border control and customs regimes and seals will be checked at the border. However, beyond this limited function, many transport operations do not take much notice of seals. Many container yards do not check or record seals, although doing so would clearly protect such operations from accusations of theft. Proof that a seal was compromised before a container enters the container yard is effective proof that a theft did not happen in the yard. Similarly, many warehouses, depots and distribution centres have relaxed standards. Many fail to check or record seals and there is often little control over how seals are fixed. Allowing a driver to seal a container they have been tasked to transport is common but introduces an obvious vulnerability to the supply chain. The driver may swap a legitimate seal for a compromised one. Seal numbers are often recorded manually on transport documentation. Discrepancies between affixed and recorded seal numbers are frequent but such discrepancies are often overlooked by busy transport operations.

Summary

As with many aspects of supply chain management, the effectiveness of sealing trailers and containers depends on how this process is managed. It is important for supply chain managers to be aware of the limitations of sealing and of bolt seals in particular. For high value cargo or cargo transiting through regions experiencing a high rate of crime, further security measures are advisable.

Additionally, it is important to note that sealing containers and trailers is only useful if the information from the seals is checked, recorded and investigated where discrepancies are noted.

A recent claim handled by TT Club serves to demonstrate the risk. A theft was noticed by the receiving warehouse during unpacking. At some point in the supply chain thieves had swapped out the original metal seal, taken the cargo and affixed an entirely different plastic seal. The seal type, material and number were all different from the original. Nobody identified or questioned the discrepancy on arrival and broke the plastic seal to commence unpacking. The opportunity to reject the shipment or question its integrity was missed. How do you then evidence that the cargo wasn't stolen at your facility? Know your customer, what seals do they use, are they checked and verified on arrival before being broken?

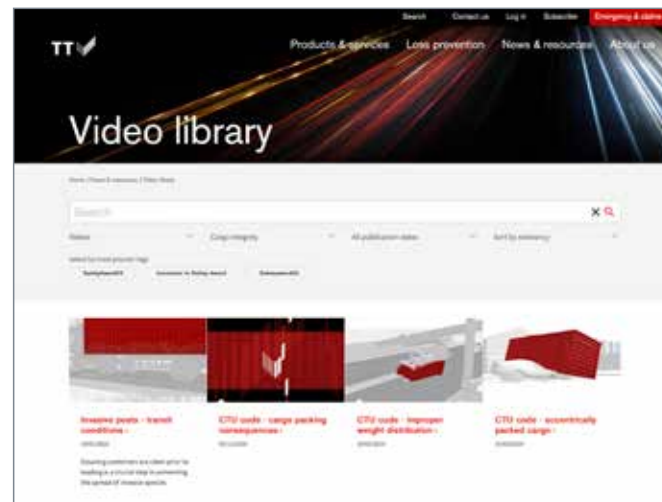
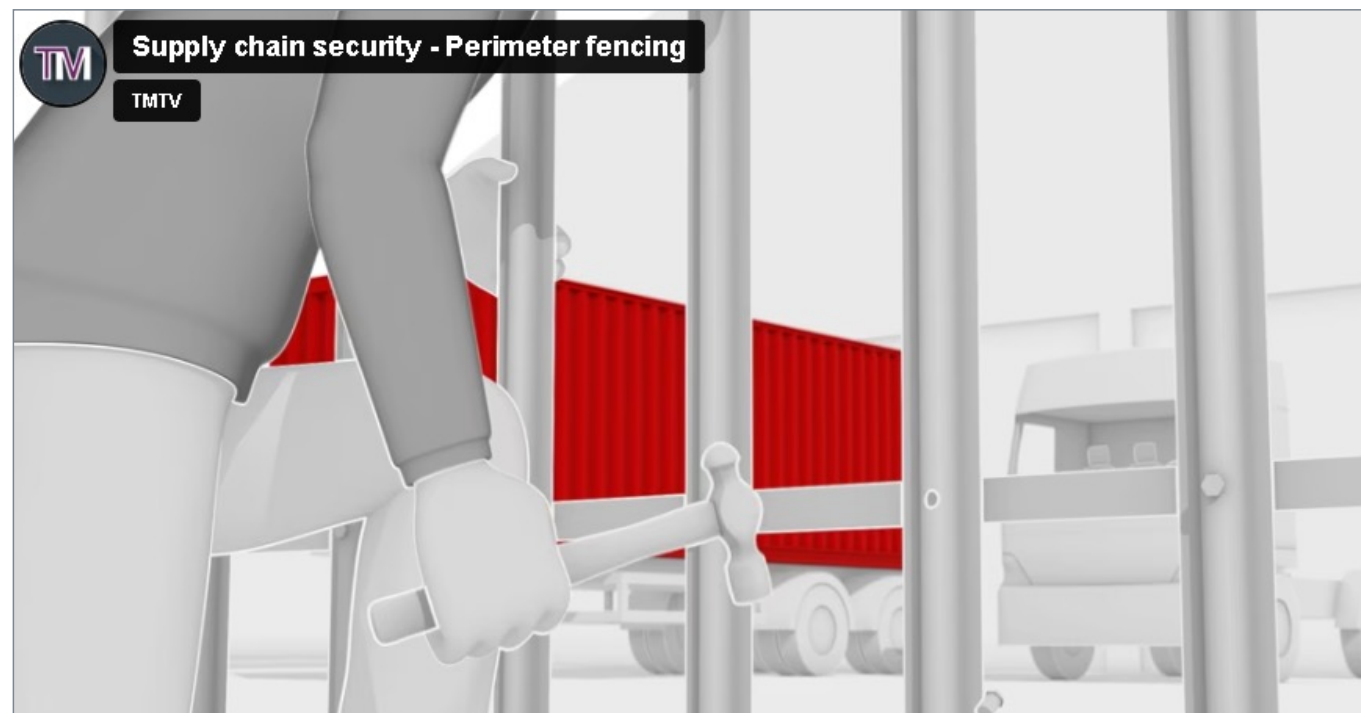
Animations

Having developed a thorough understanding of security vulnerabilities through the global supply chain, TT Club have developed a series of loss prevention animations with the aspiration of raising awareness of how thieves commonly access cargo.

Perimeter fencing

Inadequate physical security measures like perimeter fencing and CCTV can allow thieves to target your premises. Regular assessment of the adequacy of these physical measures, and making the necessary amendments, can prevent cargo loss. Poor operational practices will typically accentuate the risk.

[TT Club Video | Supply chain security – Perimeter fencing](#)



The Use of E-seals

Signum have recently been engaged in the investigation of several theft cases involving copper and other precious metals that were moved by train from Johannesburg to Durban, South Africa.

The locomotives used on those routes are regularly delayed by power cuts that often force them to stop in locations where they are vulnerable to attack. Criminals use these opportunities to open the doors of containers and steal cargo from within.

One method employed to mitigate these risks has been to carry 20' containers on the carriages with the doors facing each other so that access is impossible. However, where 40' containers are used the doors remain accessible.

In recent years, a reusable clamp with electronic locks have been attached to container door bars to restrict access. Despite this, the thieves still target the containers using angle grinder cutting tools to remove the clamps, shielding the device with a wet blanket to hide the sparks.

Some logistic firms in South Africa are embracing new technology and are fitting disposable electronic seals ('e-seals') to container doors. Should the wire which attaches the e-seal to the container door be cut, an alert is activated. Intervention teams are then dispatched to attend the scene.

These relatively cheap devices are fitted with a SIM card and emit a signal that is monitored from a central control room. The seals have a battery life of some 20 to 30 days.

The use of such e-seals has seen a significant reduction in instances of theft from containers transporting high value precious metals whilst being moved into the port of Durban by both rail and road.

“ The use of... e-seals has seen a significant reduction in instances of theft from containers. ”



AX Track: Securing Your Supply Chain in a World of Targeted Cargo Theft

In a globalised world, supply chains stretch across continents, transporting a vast array of goods which sustain businesses and support the economies of almost every country on the planet. While this interconnectedness drives industry and fuels economic growth, it also creates vulnerabilities.

According to the BSI and TT Club 2023 Cargo Theft report release in April, cargo theft is a multi-billion-dollar problem which plagues the transport and logistics sector, disrupting supply chains and causing delays which impacts consumers and businesses.

With desirable products including expensive electronics, high-value pharmaceuticals, and potentially profitable items like cigarettes and alcohol as targets for organised criminal gangs, the cargo sector – and all of those impacted by thefts – can benefit from innovative, highly effective technology to combat the problem.

AX Track gives businesses a chance to fight back against the key areas of crime identified in the report, which highlighted that 14% suffered at least one vehicle theft, 13% incurred a theft from a container or trailer, 11% experienced a theft of a container or trailer, and 11% were targeted by hijackers.

AX Track also offers a consultation service which guards against the largest area of crime that the report detected: theft from a facility (20%)

AX Track gives you the opportunity to be at the forefront of the fight against cargo theft. Offering a cutting edge, covert security solution – which protects cargo businesses from 49% of the key areas of crime identified by the report or 69% if AX Track is also protecting your facility – it is designed to safeguard your valuable cargo (or the vehicles that transport it), from origin to destination, it enables users to remain several steps ahead of the criminals.

If the worst happens and valuable cargo is taken, it can be traced while the device remains undetectable, providing a long-term, effective solution to cargo theft. Crucially, its service combines technology with human expertise – many of its staff have previously worked in police services and built strong relationships with the National Crime Agency and Interpol.

As a trusted supplier working alongside the UK Police and international forces, AX Track has partnered with a host of leading insurers and businesses. Staffed by a team of experienced professionals who have carried out operations across the UK,



Europe and Africa, its expertise also led to the recovery of a large haul of prestige vehicles from Uganda. This high-profile case helped to break up a prolific car theft gang which was stealing vehicles from the UK and shipping them abroad.

Gained through its Police Preferred Specification accreditation standard, AX Track is also a member of Secured by Design, the official UK Police Service security initiative, and is Thatcham approved.

Providing increased peace of mind and continuity in uncertain times enables AX Track's customers to focus on other crucial business operations.

• Undetectable:

As well as proactive vehicle tracking and surveillance, AX Track's advanced technology provides tracking that outsmarts a thief's detection toolkit.

• Tamper Detection:

Our intelligent device can detect unauthorised access to your shipment whether it is in the UK or overseas.

• Our Own Recovery Team:

We have our own recovery team – who are members of the Association of British Investigators – with more than 100 years of policing experience to respond 24/7 to **trace, locate** and where possible, **recover** your stolen goods or vehicle with a 99% recovery rate.

Tailored Security for Targeted Cargo:

AX Track understands that different cargo types require specific security measures. We offer customised solutions for high-value cargos such as metals and electronic devices plus the vehicles that transport these items. Similarly, for black-market targeted items like cigarettes and alcohol, we will ensure we know where your cargo should be and if it's not in the correct location, we will know where to find it.

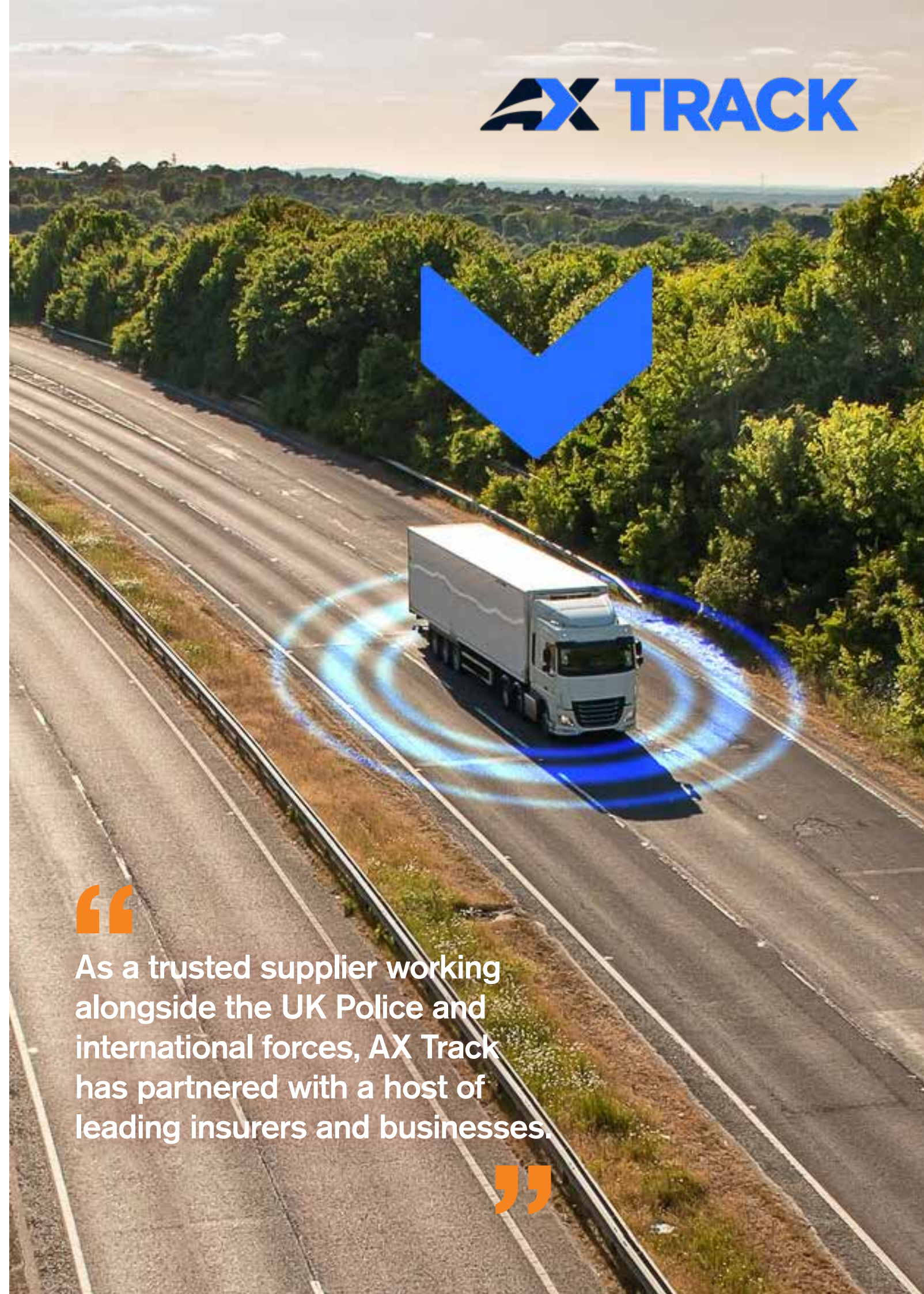
Peace of Mind for Your Business:

With AX Track, you will gain peace of mind knowing that your valuable cargo is protected. Our comprehensive security solutions minimise the risk of theft, delays and reputational damage, which could result in lower insurance policy costs. The service allows you to focus on what matters most – running your business successfully.



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A New Threat to Shippers: Sophisticated Security Breach in Cargo Transportation

TT Club and its partner organisation, Signum Services, recently completed an investigation into an incident that raises concerns for the global shipping industry. The investigation, which followed a significant cargo theft incident, uncovered a sophisticated method of bypassing security measures. The novel tactic used by the thieves meant that suspicion was not raised until long after the incident occurred.

In late December 2023, a large shipment of clothing was loaded into a container from a sub-contracted warehouse in Chittagong, Bangladesh. Following loading, a sub-subcontracted haulier collected the container from the warehouse and drove it to Chittagong Port in the early hours of 23rd December 2023. GPS tracking showed that the driver made an unscheduled stop at Saltgola Crossing on its way to the port. From Chittagong Port, the container travelled by sea to London Gateway Port. It was eventually collected from London Gateway and transported to its final destination in the UK.

After reaching its destination, the warehouse inspected the seal and, believing it intact, broke it and opened the container doors. Once the container was opened, the warehouse team quickly realised the cargo showed clear signs of tampering. The container was filled with plain cardboard boxes that showed no identifying marks and were sealed using clear cello-tape. A closer investigation of the cargo revealed that the boxes contained refuse, including fabric scraps and used packaging stuffed into black bin liners.

As the bolt seal was observed intact and seemed to show the correct seal number, TT Club asked Signum Services to investigate the matter. Forensic examination, undertaken by Brookes Bell revealed that the seal was not the original seal but had been replaced at some point during the transit. To disguise the discrepancy, the thieves had covered the seal number and replaced it with the original (expected) seal number. As the scraps of fabric and used packaging found in the container bore Bangladeshi writing, it was determined that the theft had most likely taken place in Bangladesh, perhaps during the unscheduled stop evidenced by the GPS tracker. The container had then travelled half-way around the world with a falsified seal, passing customs and port security inspections without raising alarm. By the time the theft was uncovered, the thieves had long since disappeared.



Visual examination of the seal revealed very little apart from a faint outline of the original seal number. The added, false seal number looked genuine to a casual observer. Forensic examination was necessary to identify the actual number of the false seal. Attempts to trace the seal were unsuccessful. The seal manufacturer confirmed that it was from its general stock, sales of which it does not track other than to confirm that the seal was purchased after November 2023.

This case highlights a new and significant risk to shippers. The sophisticated method used to bypass security measures, involving the alteration and replacement of container seals, represents a previously unseen threat. It underscores the need for heightened vigilance, improved security protocols, and thorough investigations to protect valuable cargo from theft. The shipping industry must take note and act accordingly to safeguard against such threats in the future.

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SAFTA Logistic – Digital Seal Solution

The SAFTA seal system was initially developed for the airline industry, to counter increasing security threats and address growing sustainability concerns. As such, it has been designed and built with Aerospace grade reliability. SAFTA Bluetooth devices digitise the security seal process – offering advanced tamper detection, game changing loss prevention, and powerful data gathering; whilst eliminating the need for single-use plastics.

Sustainability is a global concern, affecting not just aviation, but every industry. Existing security seal solutions (produced using single use plastics) destined to end up in landfill, are having a disastrous effect on the environment. SAFTA Logistic provides a fully integrated, reusable alternative. Boasting an estimated five-year battery life, each device can be refurbished up to three times – delivering a potential fifteen year life in service.

Single-use plastic seals are vulnerable to security breaches. SAFTA Logistic offers enhanced security – all door openings and closings can be accounted for with a time and date stamp, and a record of the last known location, reported to a secure central database. Additionally, a ‘tamper alert’ warning is displayed whenever an unauthorised attempt is made to open the seal.

Only authorised staff can seal or unseal cargo transport units through use of a smartphone or POS device, while signed into the SAFTA app. The system is secured through an encrypted Bluetooth connection. Each interaction generates a unique identity linked to a particular member of staff.

SAFTA can also assist in driving operational efficiencies through the supply chain. The flawed manual single-use system is wasteful, time consuming, and undermined by human error, often leading to:

- High numbers of attritional losses.
- Time-consuming manual checks jeopardised by inaccuracies.

- Lack of evidence in the event of a loss (no audit trail).
- Storage and disposal of traditional seals is subject to extensive regulations.
- Lengthy and costly investigations into theft and shrinkage.

Designed to be retrofitted to any cargo transport unit, the smart SAFTA device has the potential to deliver full visibility and an accompanying audit trail, granular seal history, maintaining cargo integrity throughout the journey.

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Digitally check seal integrity across an entire fleet of vehicles – even without line of sight.
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Security Seals – Operational Benefits

The global nature of the modern supply chain dictates that there will be multiple disparate stakeholders involved in almost every cargo shipment. The security seal has a pivotal role to play and assists maintaining integrity throughout. There are diverse designs where security seals are concerned but ensuring that the security seal is compliant with the definition of high-security mechanical seals in ISO 17712 should be a fundamental consideration.

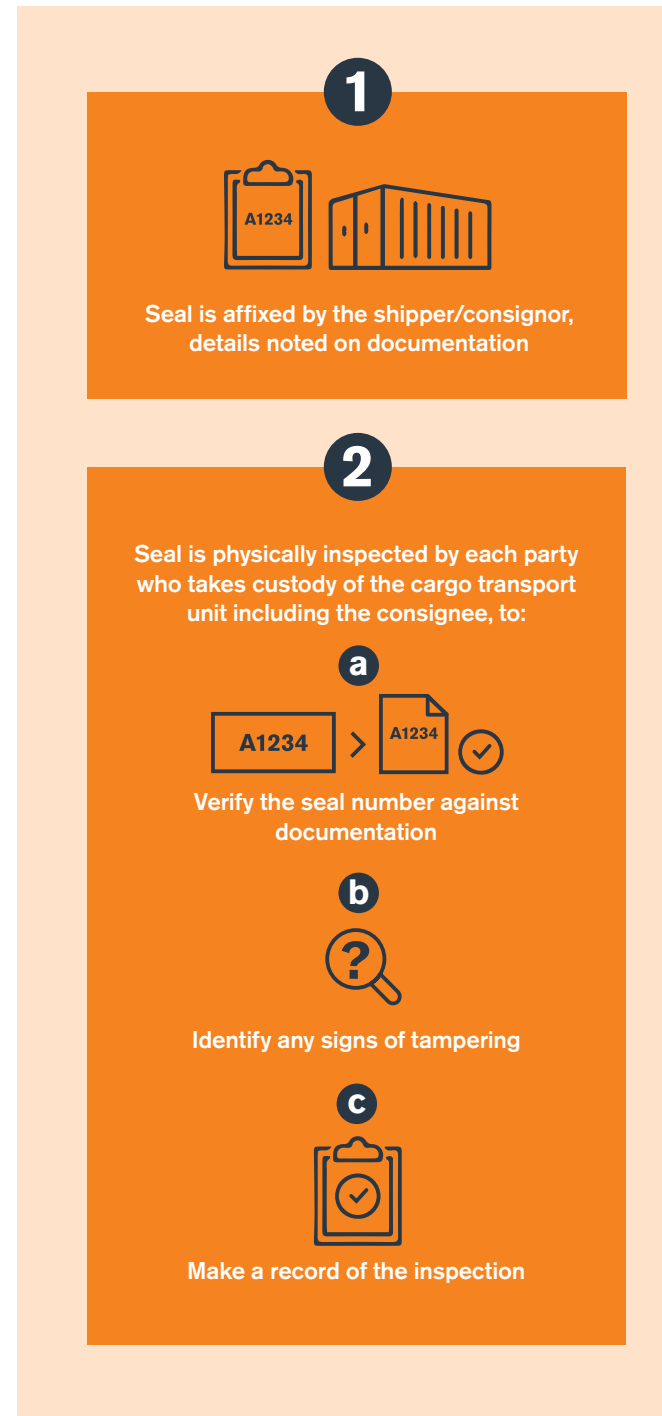
Security seals assist ensuring integrity through the chain of custody. There are myriad benefits of implementing a sound security seal procedure. The World Customs Organisation (WCO) [SAFE Framework of Standards](#) highlights:

- Improved security against acts of terrorism that exploit the global trade in goods.
- Reduced risk of economic hardship caused by disruptions to or closures of trade in response to terrorist acts.
- Improved security against theft and diversion of cargo, with consequent reductions in direct losses and indirect costs, such as insurance.
- Improved security against illegal transport of materials such as narcotics and weapons, and of persons.
- Improved security against the illegal movement of “black market” and “grey market” trade goods.
- Reduced risk of evasion of duties and taxes.
- Increased confidence in international trading systems by current and potential shippers of goods.
- Facilitation dividends, such as a reduced number of examinations (reduced border times) and access to simplified procedures.

If upon inspection the security seal is not in place, shows signs of tampering, or shows a different number than expected in the cargo documentation, establishing a robust escalation process that is immediately implemented is vital. The WCO SAFE Framework of Standards suggests:

- The receiving party must bring the discrepancy to the attention of the party tendering the container and the shipper.
- The receiving party must note the discrepancy on the cargo documentation.
- The receiving party should notify Customs or law enforcement agencies, in accordance with national legislation.
- Where no such notification requirements exist, the receiving party shall refuse custody of the container pending communication with the party tendering the container and until such discrepancies can be resolved.

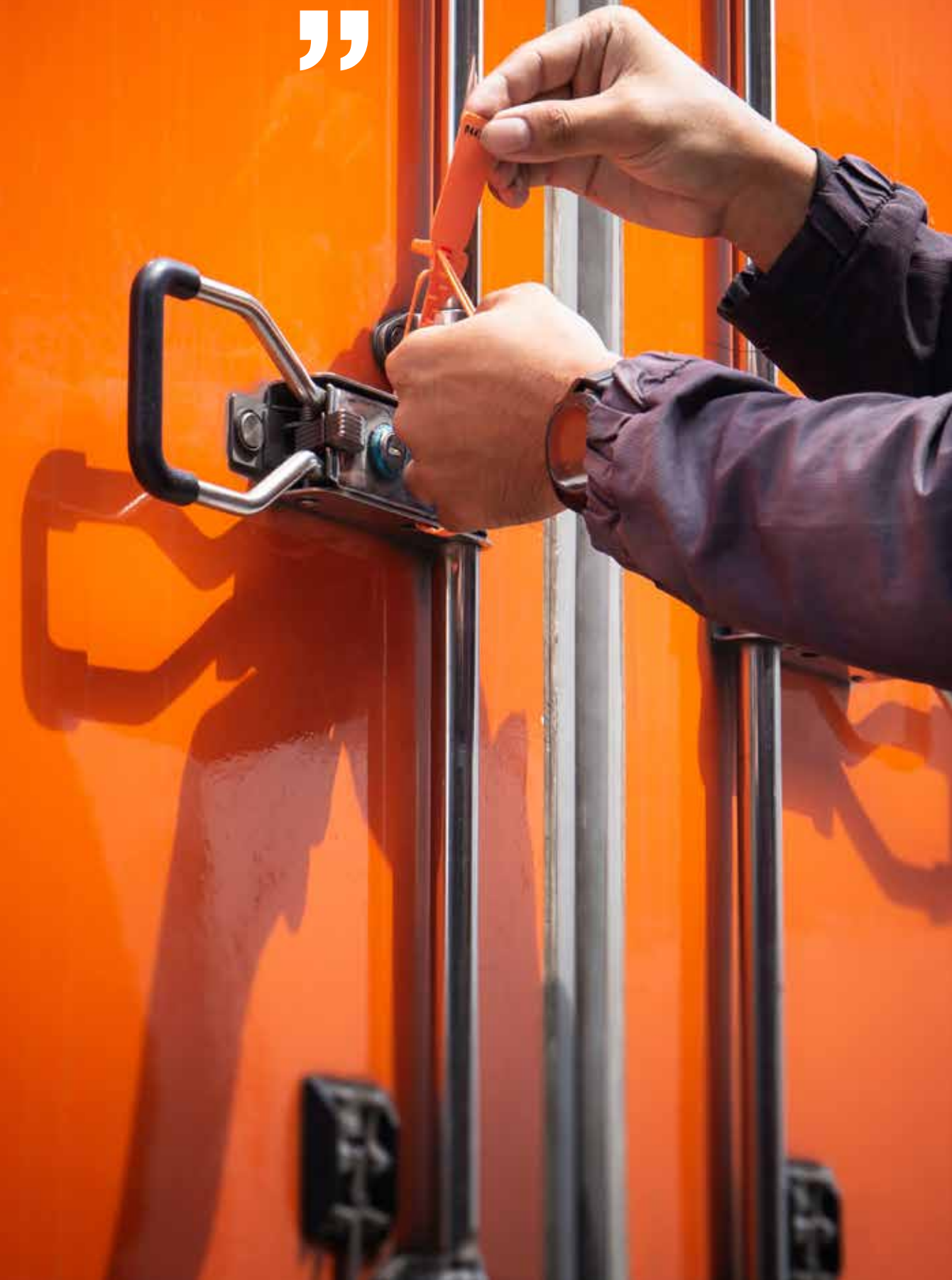
Once discrepancies have been resolved, the receiving party shall affix a security seal to the container and note the particulars, including the new seal number, on all pertinent cargo documentation.



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The complete freight crime solution

The Motorwaybuddy system is a suite of products recognised by UK trade organisations as the go-to truck-stop locator for the UK and European driver.

An application that has evolved from truckstop locator to complete freight crime solution, Motorwaybuddy takes cleansed data from UK police forces to assist UK and European hauliers remain vigilant and make educated decisions when considering their overnight parking.



Help prevent cargo crime



NaVCIS Freight | Membership

NaVCIS Freight members receive:

- 26 fortnightly bulletins
- 12 monthly reports
- Four quarterly reports
- Our annual freight crime bulletin

Annual fees* based on size of your organisation:

- Small business £700
- Medium business £2,500
- Large business £4,500

*Size of organisation determined according to published annual revenue. Fees correct as of September 2021. NaVCIS hopes to reduce the cost of fees in the future, as membership numbers increase.

For further details, contact us: freight@navcis.pnn.police.uk | 07388 859423



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