KSTRONG®
UNRIVALED SAFETY.

KS GROUP

# T-LINE SAFETY SYSTEM

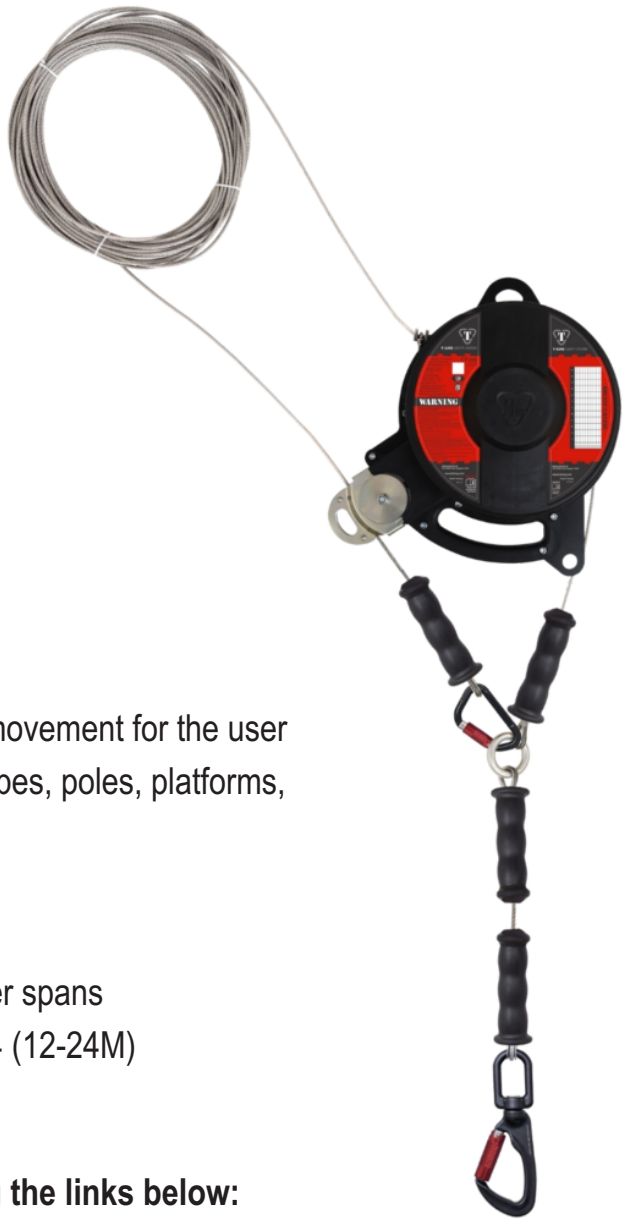
## PRODUCT USAGE

# TABLE OF CONTENTS

# PRODUCT OVERVIEW

## T-Line Safety System

The T-Line is a unique innovative system pioneering the merging a lifeline and fall arrest mechanism, ensuring comprehensive fall protection for elevated workers. Its unique design allows usage in areas where conventional fall protection methods falter. The T-Line comprises a singular housing unit housing two distinct lifelines on separate spools, operating independently. Typically arranged in a triangular configuration, it accommodates spans up to 12m without intermediate supports, overcoming engineering challenges of traditional single-line systems. In a fall event, the cables equalize, preventing pendulum swing and slide inherent in traditional setups.



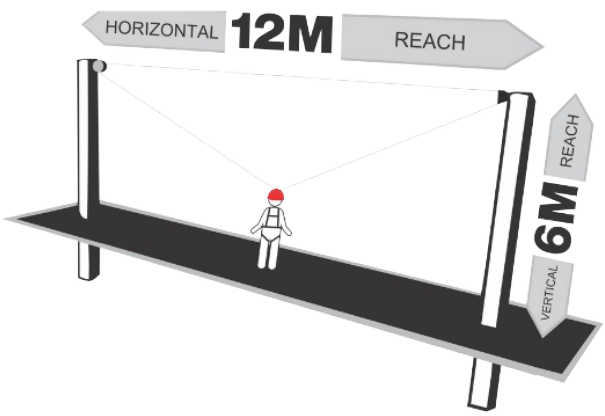
## Features

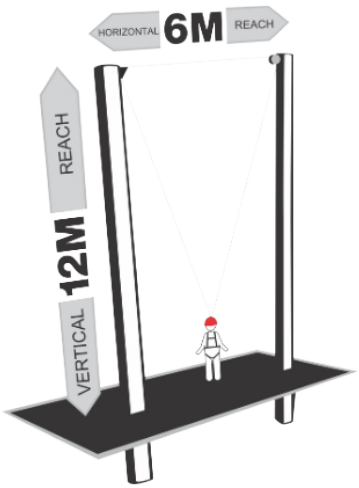
- Consists of two lifelines allowing Horizontal or Vertical movement for the user
- Freedom of Movement to access work areas such as pipes, poles, platforms, walkways, loading areas, etc
- Suitable for Permanent or Temporary Installations
- Quick & Easy Installation
- Reduced swing fall risk & fall arrest distances over larger spans
- Comes in 2 models - AFA945012 (6-12M) & AFA945024 (12-24M)
- Conforms to EN 360:2002 & EN1496:2017 Class B

**Learn more about the T-Line Safety System by clicking the links below:**

- Technical Data Sheet
- Video
- Product Page
- Flyer

SCAN TO VIEW
T-LINE VIDEO



# Product Usage – Truck Wash Bays

## The Challenge

- Workers need to access the tops of trucks for cleaning purposes. This can pose the risk of a fall from height, so a fall protection system was required to ensure that the tasks can be carried out safely
- The fall protection system was required to provide access over the entire length of the 24m long wash bays. This would have been problematic for a traditional system, especially on the outdoor wash bay that would not allow for the installation of intermediate supports
- A system is needed that will ensure that very small fall arrest distanc es are provided, due to the small fall clearances to some obstructions.

## The Solution

- A 24m(80') T-Line was able to be installed in each wash bay. This allowed the users to access the full length of the wash bay from the one system.
- The total installed cost of the T-Line was far cheaper than that of any other alternatives, especially for the outdoor wash bay as the T-Line only required one steel pole to be installed at the end of the 24m long wash bay, with no intermediate supports.
- The short fall arrest distances provided by the T-Line were more like those of a rigid rail type system, except at a fraction of the cost.


T-Line installed on a 24m long Truck Wash Bay

The T-Line is accessed via a tag line and it retracts up to the roof when not being used, so that it does not get in the way of any truck movements.

The T-Line on the Outdoor Wash Bay spans 24m without any intermediate supports, yet still provides extremely low fall arrest distances. The total installed cost of the system was far cheaper than any other systems, due to the reduced cost of the structural steelwork.

# Product Usage – Mining Equipment Assembly Area

## The Challenge

- Workers need to climb on top of the various pieces of mining equipment, whilst they are assembled and tested. This can pose the risk of a fall from height, so a fall protection system was required to ensure that the tasks can be carried out safely.
- The fall protection system needed to cater for pieces of equipment with various shapes and sizes.
- The structural steelwork above the workshop would not have allowed a horizontal lifeline to be installed unless there was significant expenditure on additional steelwork.
- A system is needed that will ensure that very small fall arrest distances are provided, due to the small fall clearances to some obstructions.

## The Solution

- A 12m(40') T-Line was installed in the work bay. This allowed the users to access the full length and width of any piece of equipment from the one system.
- The was able to be installed on the sloping roof without the need for expensive structural modifications.
- The short fall arrest distances provided by the T-Line were more like those of a rigid rail type system, except at a fraction of the cost. This provides superior levels of safety for the users when working in the vicinity of potentially dangerous objects.

The T-Line is installed under the sloping roof without the need for extensive additional steelwork to provide a horizontal installation. The user can access anywhere along the length or width of any odd shaped piece of equipment


The T-Line offers superior protection with short fall arrest distances, so as to ensure the safety of personnel when working in close proximity to dangerous objects.

# Product Usage – Roof Access and Various Maintenance

## The Challenge

- Maintenance Contractors require a versatile fall protection system that can be easily carried to each work location and will provide effective protection in a wide range of applications, including overhead installation, single line use and foot level installations such as roof tops
- A system was required that provided superior levels of safety, with less restrictions and optimal freedom for the user.
- The fall protection system needs to work in complicated environments and not get snagged on roof services etc
- Needs to facilitate rescue of fallen user

## The Solution

- 12m (40') T-Line used for all maintenance related fall protection needs, including installation on rooftop . System is easily installed and requires no tensioning etc
- The T-Line provides access anywhere within a 12m(40') x 12m(40') section of roof, with a far reduced possibility of pendulum swing over edges, due to short 1.5m (5') lanyard attached to T-Line
- The T-Line can loop around any services penetrating through the roof
- The Winch mechanism can be used to rescue a user in the event of a fall

T-Line installed on flat roof

The T-Line will provide freedom for the user to move about on the rooftop without getting caught on any services etc fixed to (or penetrating through the roof), as the T-Line's lifelines loop around these obstructions.

The T-Line roof installation drastically reduces the potential for a pendulum swing the event of a fall near the edge of a roof as the lanyard extension is only 1.5m(5') long.

# Product Usage – Tanker & Confined Space

## The Challenge

- Preference to mount system on the main beams in the sloping roof.
- Lots of services and steelwork that would restrict traditional fall protection systems.
- Continuous protection required, from the time the user leaves the walkway, to accessing the top of the tanker and into the tank itself (confined space).
- Required simplified rescue system.

## The Solution

- 2x 12m (40') T-Line units mounted under the sloping roof, provides the user freedom to access anywhere on top of or inside the tankers without the possibility of a pendulum swing and with very short fall arrest distances.
- Life Lines bypass plumbing services and other steelwork hanging below the roof, whilst maintaining total freedom for the user.
- Each user is able to connect to the T-Line on the walkway, then walk out on top of the tanker. An external winch is used to lower one user into the confined, whilst the spotter/supervisor remains at the entrance to the confined space. If the person within the confined space requires retrieval, the T-Line winch can be easily deployed and used to extract the person. The winch can even be operated by someone from behind the safety of the hand rail on the walkway.


Sloping the roof for installation

Loops Around Existing Services

Additional Pullies Use to Redirect Lifeline

Which can be operated from the safety of the walkway

Use can park the Twin Line mode above the entry to the confined space, then enter the confined space in single line mode only.

# Product Usage – Tanker Trailer Service Facility

## The Challenge

- Workers need to access the tops of the tanker trailers for a variety of manufacture and servicing requirements. This can pose the risk of a fall from height, so a fall protection system was required to ensure that the tasks can be carried out safely
- The large steel sections that make up the roof structure, were not located directly above each service bay, this made it difficult to find a fall protection system that would work, without having to install a lot of expensive additional steelwork
- The roof pitch is quite steep, which means that intermediate supports for a horizontal lifeline would have been more difficult and costly to install
- A system is needed that will ensure that very small fall arrest distances are provided, due to very little fall clearance to some obstructions

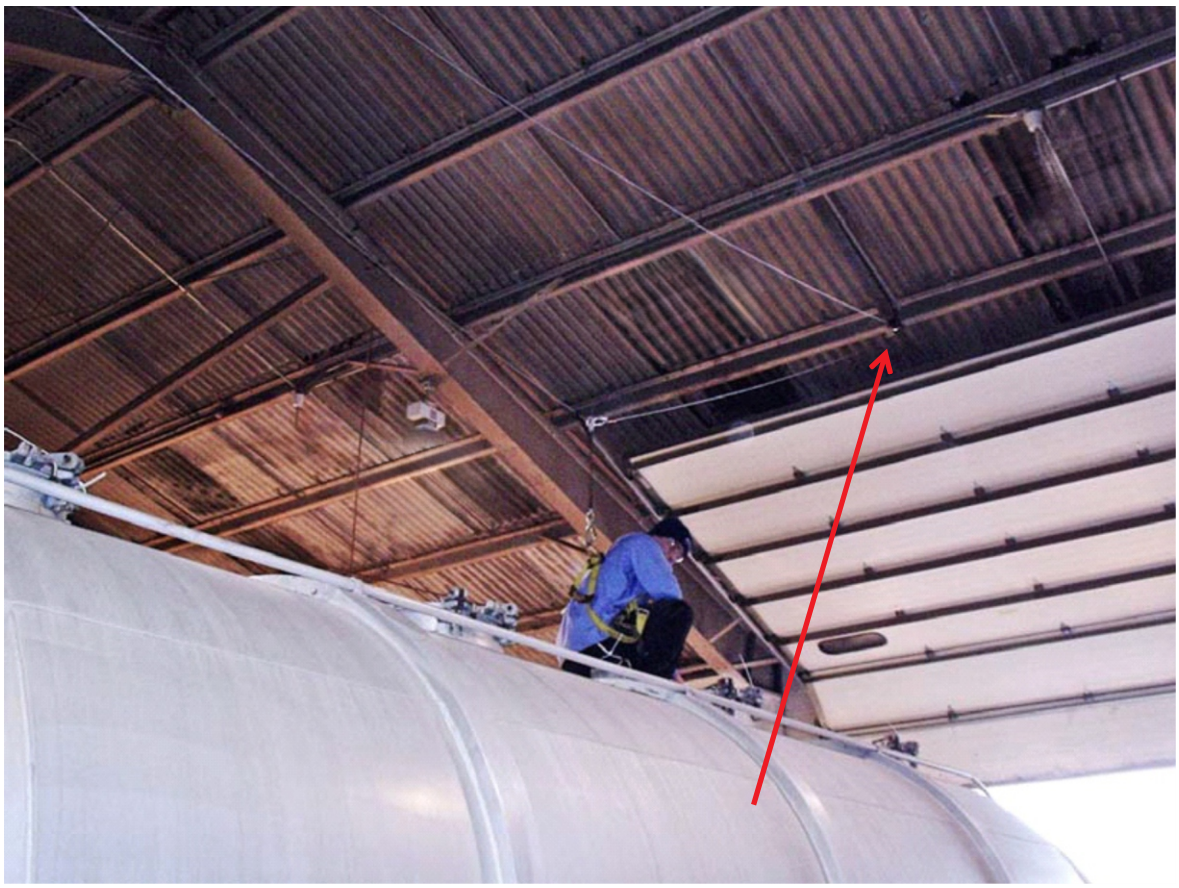
## The Solution

- A 12m(40') T-Line was able to be installed on the roof purlins, due to the lower design forces for the anchorages on a T-Line, this helped drastically reduce the cost. The installation was quick and simple, seeing that the T-Line only required anchor points at each end (with no intermediate supports)
- The T-Line allows the users to access the full length of the tanker trailers, for any tasks that need to be performed, whilst providing the protection of extremely short fall arrest distances. The user is protected from the moment that they leave the ground

T-Line installed at Tanker Trailer Service Facility – allows the user to hook on before leaving the ground.

# TANKER TRAILER FACILITY

The T-Line allows the user to access anywhere along the length or width of the tankers.



The T-Line did not require additional steelwork to be installed, here it can be seen that the T-Line was able to be fixed to the roof purlins. There is only one fixing at each end, with no intermediate supports

# Product Usage – Conveyor Access

## The Challenge

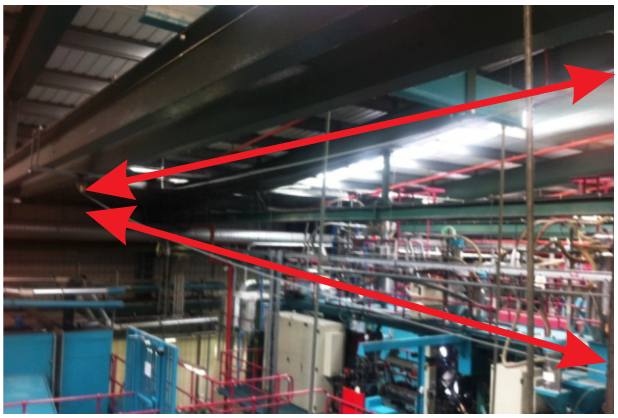
- Vehicle Component Manufacturer has an assembly line that features multiple conveyor systems that cannot be provided with hand rails and wallkway access etc. Personnel must access the conveyors for servicing and to rectify any jams etc.
- Complex structure does not facilitate access for horizontal lifelines, anchorags at each end of the conveyor are at different heights.
- Many Services etc that would obstruct traditional fall protection systems from working properly.
- Expensive Engineered systems being considered but still not ideal.

## The Solution

- 12m (40') T-Line systems installed to provide access to each conveyor. The system retracts up out of the way when not in use and can be retrieved using a tag line etc stowed at convenient locations.
- Service personnel can access anywhere along the conveyors or related infrastructure due to the horizontal and vertical freedom provided, with no possibility of a pendulum swing.
- The low fall arrest distances offered by the T-Line ensure that adequate fall clearance is provided to nearby equipment etc.
- Lifelines can be directed around services etc without compromising the freedom or safety of the user.
- The total installed cost of the T-Line systems represents a fraction of the cost of an engineered system.

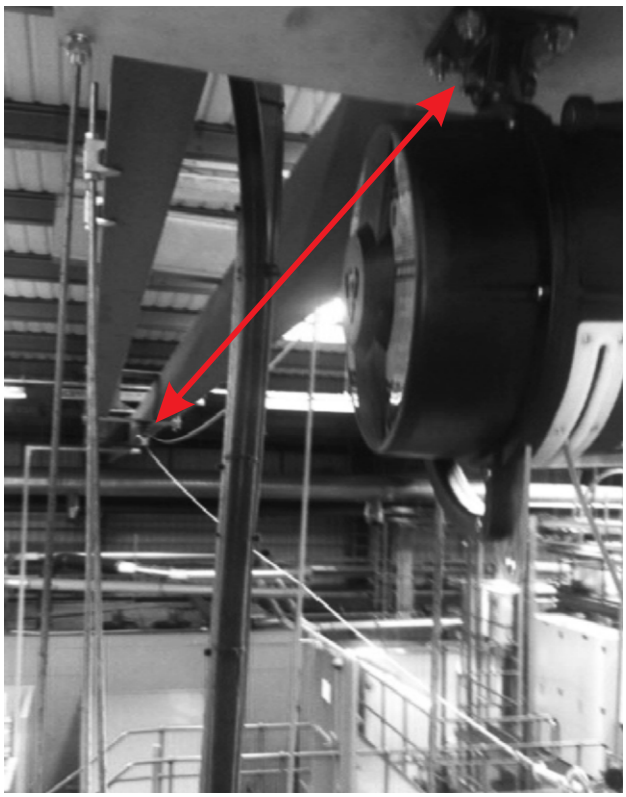
T-Line mounted above the conveyor, with each end at different heights

# CONVEYOR ACCESS



Quick and simple installation of the T-Line at each end, with no intermediate supports required.

Service Technicians free to access any location on the conveyors.



Easy Installation of the T-Line in a complicated environment with many services etc present.

## Product Usage – Frans De Wit BV

Taking worker safety seriously is a core principal for Frans De Wit BV. For complete and safe access in their new MTR Tank Container Building in Moerdijk, Frans De Wit have selected the T-Line as their safety system when working on top of ISO Tanks .

By utilising the canopy over the work area the installation was straight forward and allows access from the gantry onto the tank top.

The T-Line was chosen for this installation, used with Beam Clamps, a full body harness and rear extension strap to allow ease of connection for the user.

The new MTR building in Moerdijk


T-Lines installed under the canopy in the 3 bays where access is required.

Using the T-Line Beam clamp the installation was straight forward

Lowering the Bridge

Connecting the T-Line

Crossing onto the Tank

Clear to work freely

# Product Usage – Heavy Vehicle Workshop

## The Challenge

Mechanics working on Heavy Vehicles such as Mining trucks etc can be exposed to potential fall risks when performing some tasks.

A fall protection system was needed that could allow the mechanics to access anywhere on the vehicle, whilst ensuring that they are protected from a fall and possible pendulum swing.

A system is needed that will ensure that very small fall arrest distances are provided, due to very little fall clearance to some obstructions.

The very high roof was problematic for rigid rail and horizontal life line type systems, due to the very long lanyards required. The fall protection system could not be mounted below the crane, as this would have created an obstruction to its movement.

The fall protection system needed to allow the overhead crane to remain in operation, whilst personnel are working on the vehicles.

## The Solution

A 12m (40') T-Line was installed to provide access for all vehicle types in the service bay. Alternatively, a 24m(80') T-Line could have been used for multiple bays.

The T-Line provides access anywhere on top of the vehicle and provided superior protection with fall arrest distances as short as 300mm (1') .

The T-Line can be looped around the overhead crane, so as to allow the mechanics to work on the vehicle, whilst they use the crane to help position large items.

The T-Line retracts up to the roof when not in use and a oids clashing with the crane.

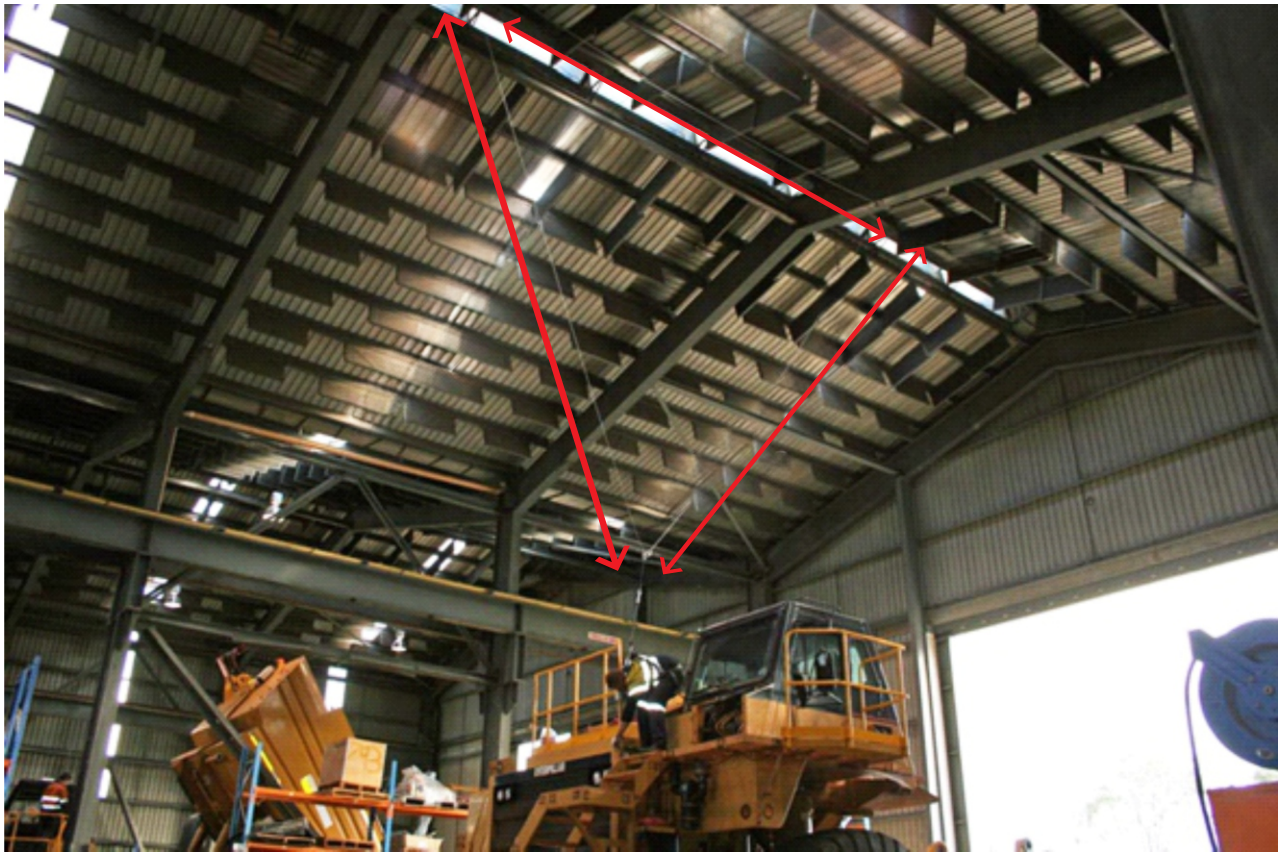

The Heavy Vehicle Workshop caters for many different vehicle types.

In this image, a 12m(40') T-Line is installed over a service bay. A 24m(80') T-Line could also be used to provide even larger work areas.

The T-Line retracts up to the roof and out of the path of the crane when not in use.

The T-Line allows the user to move anywhere on the vehicle, whilst ensuring extremely small fall arrest distances as short as 300mm(1') are achieved. The user is also protected from any possible pendulum swings in the event of a fall.

Image showing the 12m (40') T-Line spanning one service bay and retracted up to the roof structure.



The T-Line is not affected by the height of the roof structure, where single lanyard systems can experienced reduced effectiveness when a long lanyard lags behind the user.

# Product Usage – Isotainer & Container Repair Facility

## The Challenge

Workers need to access the tops of the isotainers and other types of containers to conduct the repairs. This can pose the risk of a fall from height, so a fall protection system was required to ensure that the tasks can be carried out safely.

There are a lot of services installed beneath the roof, so the fall protection system needed to be able to work with these in place, whilst not restricting the movement of the worker.

The atmosphere can be quite corrosive due to the cleaning activities that take place. The fall protection system needs to be able to c ter for such an environment.

A system is needed that will ensure that very small fall arrest distances are provided, due to very little fall clearance to some obstructions.

## The Solution

A 12m(40') T-Line was installed on the roof structure above and it provides access for the workers to move anywhere on top of the isotainers in that bay. The installation was quick and simple, seeing that the T-Line only requires anchor points at each end (with no intermediate supports).

The T-Line life lines are looped around the overhead service pipework. The user is able to move about freely below this pipework without restriction and free of any possibility of having the system get caught or “snagged” on the pipework.

Due to the nature of the T-Line, the housing containing all moving parts etc is away from the work area, it is also very well sealed, so it is not affected by any steam etc used to clean the tankers.

The user is able to move anywhere on top of the isotainers without any restriction caused by the overhead service pipework.

# Product Usage – Aircraft Hangar

## The Challenge

Light Aluminium structure couldn' t support the loads from HLL

High Roof would have resulted in less than ideal lanyard lengths and possible jerky motion with greater fall arrest distances if trailing behind

Structural bracing was inhibiting the installation of other system types

Expensive Engineered systems being considered but still not ideal

Sloping roof preventing traditional horizontal systems from being installed for access

Mobile tower type systems being considered for wing access but only provide access to a small portion of the wing and must be constantly relocated. Also very expensive.

## The Solution

2x XL T-Line systems installed to provide access to the fuselage

Lower forces from T-Line were suitable for the lighter support structure

The T-Line lifelines extend down to the user, so no long lengths of lanyard required

The T-Line provides exceptionally low fall arrest distances (in this instance approx. 2' or 600mm)

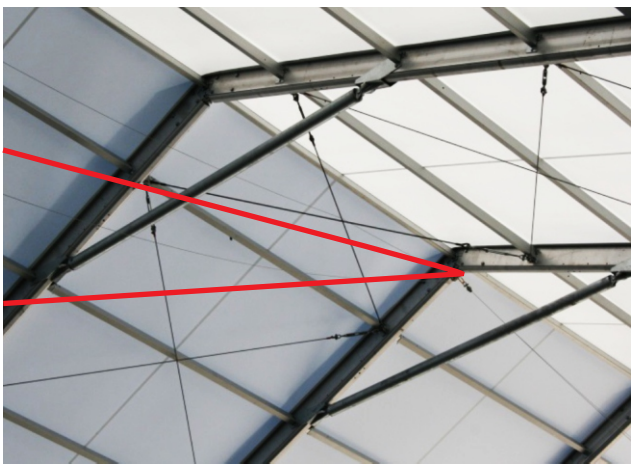
The T-Line could be mounted at the apex of the roof structure, the life lines simply loop around the structural bracing members without inhibiting movement for the user

1x XL T-Line to be installed on each side of the sloping roof, to facilitate access to each of the wings


**XL T-Line Installation for Fuselage Access**

# AIRCRAFT HANGAR

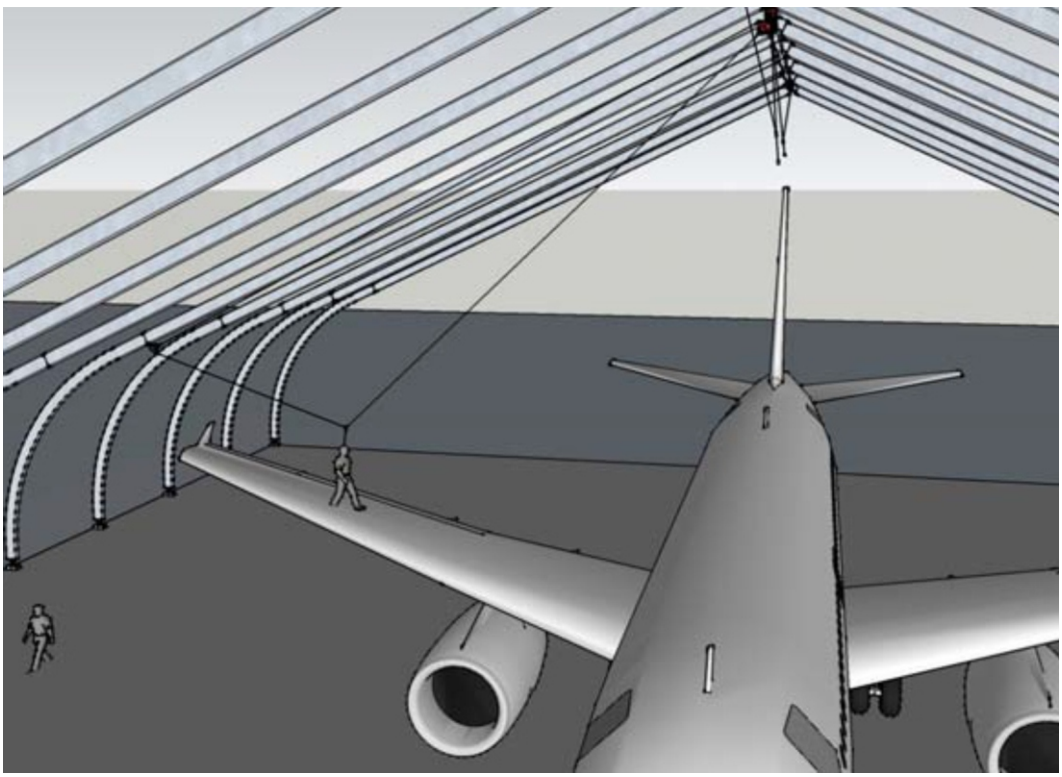
Simple Anchor Points at each end, with no intermediate supports



The Lifelines loop around the existing structural braces in the roof, without limiting the movement of the user or the T-Line.

A Tag Line can be used to access the T-Line from ground level.

When the system is not needed, it is allowed to retract up to the roof, so that it is out of the way of any aircraft movements and the tag line is tied off at an accessible location.

Proposed T-Line Installation for Wing Access

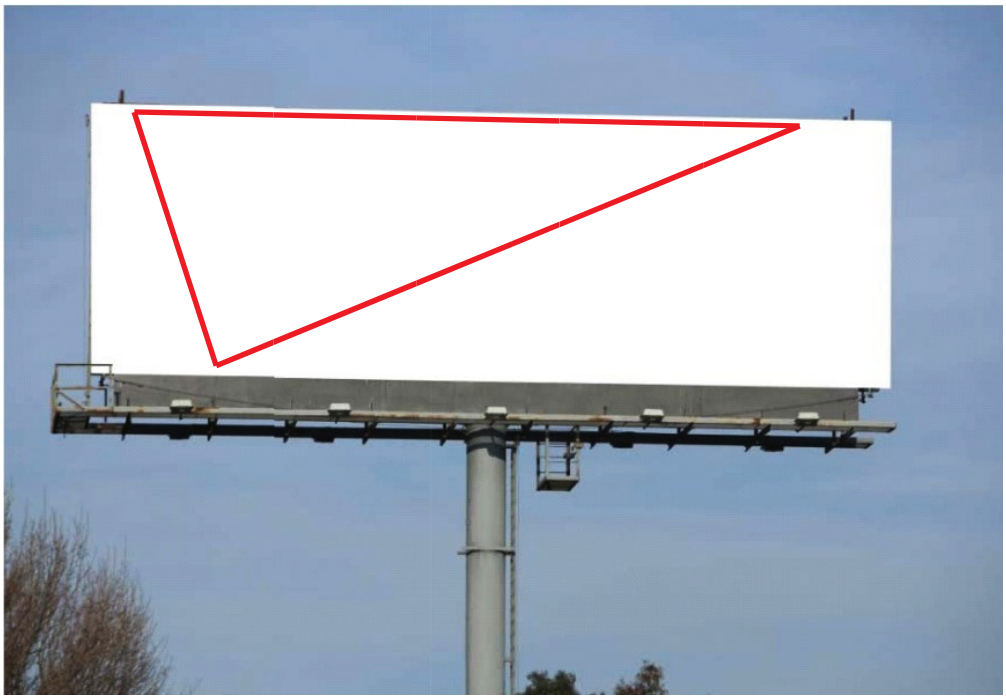
## Product Usage – Billboard Temporary and Perman ent Installations

### The Challenge

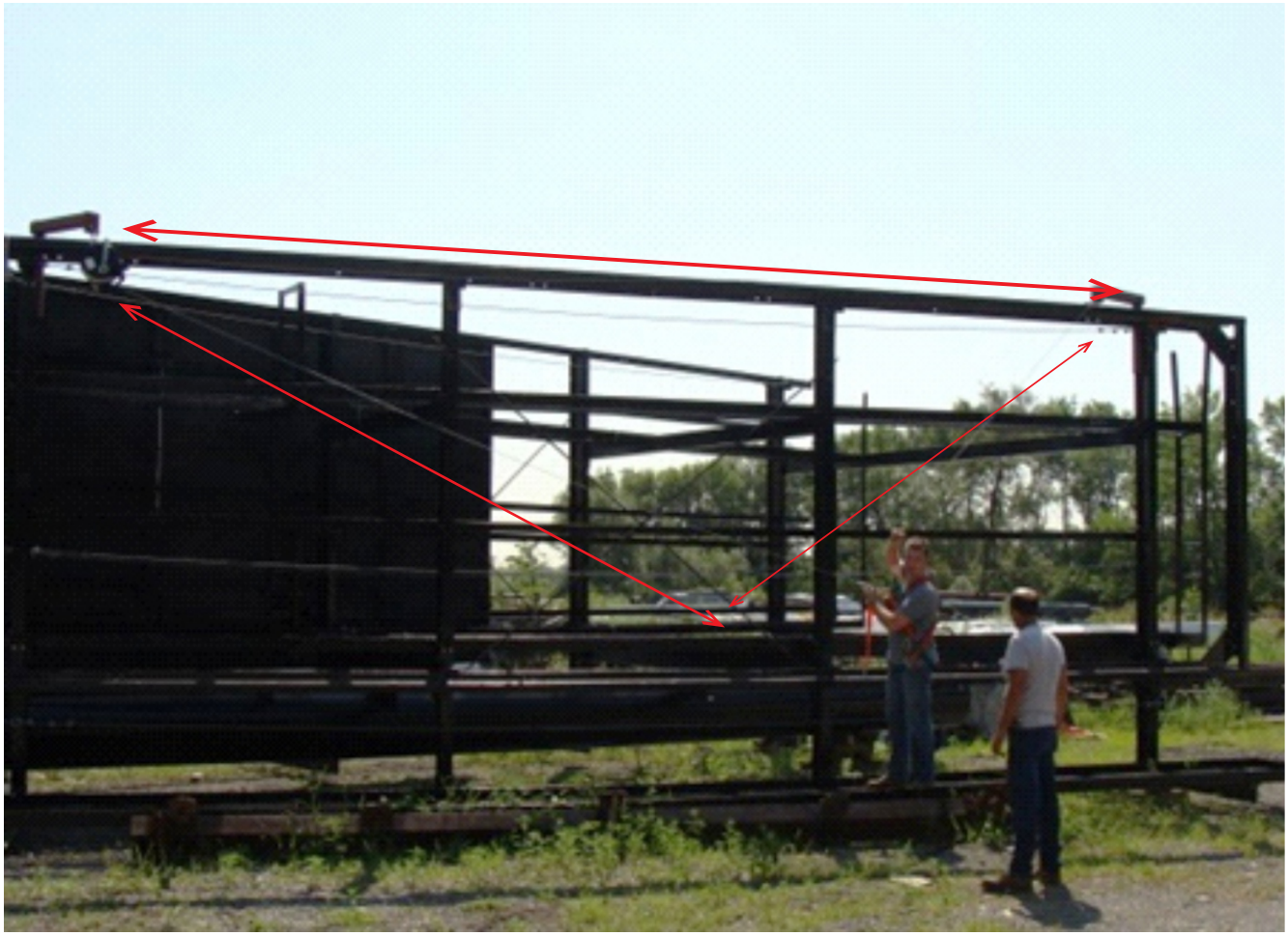
- Billboard Workers need to be provided with protection against falls whilst changing the artwork on billboards.
- They need a system that is quick and simple to install. The preference is for a temporary system that can be carried to each work site.
- Most typical billboards do not have existing structure that can facilitate mid span supports for horizontal lifelines etc. Billboards can span up to 24m / 80'.
- The fall protection system needs a combined rescue function, so as to facilitate the rescue of a user in the event of a fall.
- A vertical system is needed to provide access for the worker whilst ascending the access ladder.

### The Solution

- A 12m(40') T-Line can be used where temporary acces is required to Billboards. A 24m(80') T- Line is better suited to larger billboards that require a permanent fall protection system. This allows the workers to access the full length and height.
- The T-Line can be installed at each end of the billboard , without the need for any intermediate supports The 12m T-Line can easily be erected and removed and taken to another site, as it is self-retracting and very simple to install.
- The T-Line provides a total solution to the workers fall protection needs, by providing single line access when climbing the access ladder, twin line access when moving horizontally and incorporated rescue which to assist the rescue plan for a person in the event of a fall.



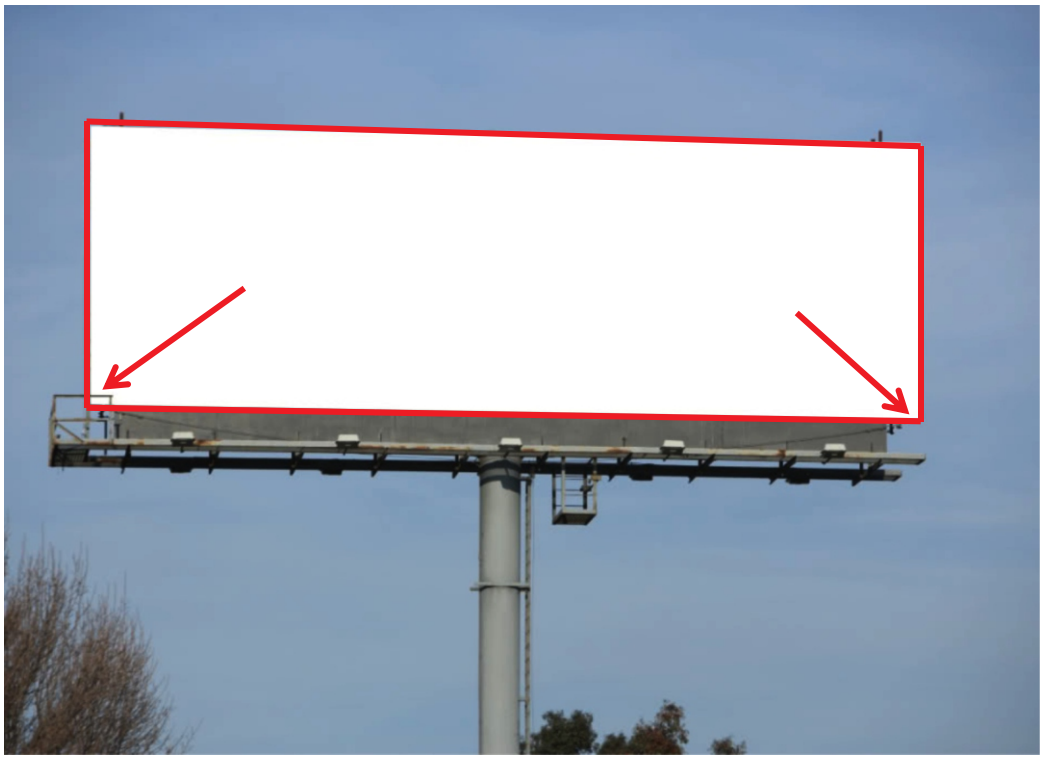
# BILLBOARD INSTALLATIONS



A trial T-Line installation in a billboard storage yard

The T-Line requires just a single anchor age at each end, which makes it well suited to billboard applications. The ease of installation makes it possible to be used for temporary installations.

The T-Line provides free a ccess for the user anywhere along the length or width of the billboard.



Because the lifelines on the T-Line are only under spring tension, they can be tucked away behind hooks, so as to keep the lifelines out of view when not being used.

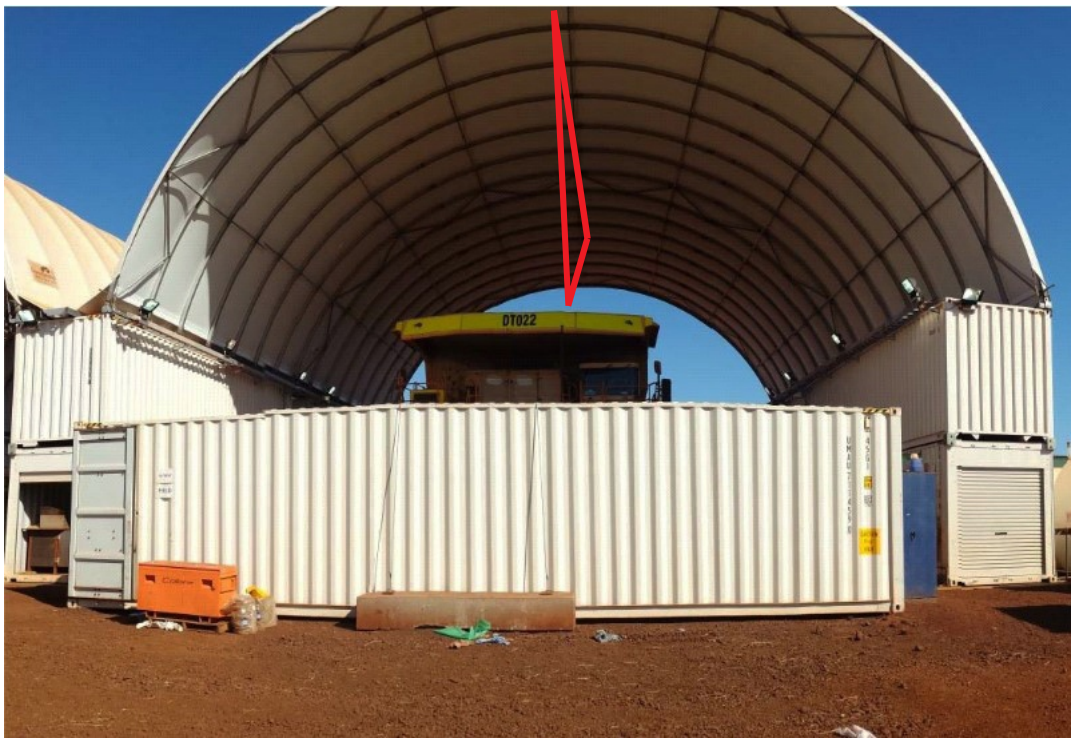
# Product Usage – Container Dome and other temporary structures

## The Challenge

- Lightweight temporary structures like container domes etc are commonly used for field works hops in mining and construction etc. These lighter structures typically cannot support the design loads from horizontal lifelines and the like.
- Often tasks being carried out in these facilities require the use of fall protection due to the presence of fall risks whilst working on large pieces of equipment, such as mining trucks.
- A fall protection system was needed that could allow the mechanics to access anywhere on the vehicle, whilst ensuring that they are protected from a fall and possible pendulum swing.
- A system is needed that will ensure that very small fall arrest distances are provided, due to very little fall clearance to some obstructions.

## The Solution

- A 24m(80') T-Line can span the full length of the workshop, with only a single fixing at each end, which makes installation quick and simple.
- The forces produced by the T-Line are much lower than that of a HLL and when the engineering check was performed, it showed that the dome structure was capable of supporting the required design loads.
- The T-Line provides access anywhere on top of the vehicle and provided superior protection with fall arrest distances as short as 300mm (1').



The T-Line provides access to anywhere on top of the vehicle being worked on, whilst providing the safety of extremely small fall arrest distances and the totalinstalled cost of the system is a fraction of the cost of a rigid rail type system.

Multiple T-Line Systems can be installed side-by-side, so as to allow multiple users complete freedom to access the full length of the work area, without having to swap lanyards etc to pass each other. The total installed cost of several T-Line's costs less than a similar traditional system and the T-Line solution provides greater levels of freedom and safety for the user.

KStrong Asia Pacific

Contact E-mail : customercare@kstrongasia.com

www.kstrong.com/asia

USA SOUTH AMERICA AUSTRALIA NEW ZEALAND ASIA