Building Products Delivery Working Group

Eliminating Risk and Mitigating Risk of Falls from Height

Version: 1.0
Published date: October 2009




Transport Industry Guidelines

Preface

The Building Products Delivery Working Group (BPDWG) is a committee of manufacturers, logistics & transport companies and regulators (HSE). The aim of the BPDWG is to aid in developing best practice in the Building Products Supply Industry for loading, moving and unloading goods safely.

As a recent initiative, the committee examined ways of eliminating or reducing the risks of working at height associated with the use of load security techniques.

This document reports the findings of that study. The intent is to illustrate what equipment and methods are available and offer a general insight into their capability and limitations. This may assist in determining what equipment or methods may best suit a company's needs based on a suitable assessment of risks to health and safety and taking into account the environment in which the equipment is to be used and relevant economic factors.

This does not detract from the need to comply with current legislation.

It is not the intention of the BPDWG to endorse a particular item, product or brand.

There may be advantages to using combinations of the systems shown. This will be dependant on the load, the site and individual company requirements.

Although the aim of this document is to protect the driver and others involved in loading/unloading of vehicles, the systems illustrated may contribute to the restraint or containment of the load but the extent of load security should be in accordance with the DfT Code of Practice, Safety of Loads on Vehicles.

(http://www.dft.gov.uk/pgr/roads/vehicles/vssafety/safetyloadsonvehicles.pdf)

Loads should always be restrained and secured in accordance with the DfT Code of Practice, and all equipment should conform to the relevant standards ((Load Restraint (webbing straps) – BS EN 12195, Load Containment (cargo netting/assembly) – BS 6451)).

At the rear of this document is an acknowledgement to all those involved in the research. Should you feel that you require further clarification on a particular subject then feel free to contact those companies to gain further assistance.

Ben Young, Wincanton

Chairman, BPDWG

Foreword

The Health and Safety Executive (HSE) welcomes the publication of this practical and helpful guidance from the Building Products Delivery Working Group. HSE is always keen to see industry taking ownership of its problems, and this is an excellent example of existing users pooling their experience of the products currently available for the benefit of others. I'm sure that greater awareness of what already exists will lead to this equipment being adopted more widely in the short term, but I also hope that it prompts further innovation and improvements in the longer term - and I look forward to new, even better systems being featured in the future.

I would like to thank all those companies who have contributed to this guidance for sharing their knowledge of the systems described. They have shown real leadership in tackling the risks of working at height associated with the use of load security techniques.

Geoff Cox

Head of the Manufacturing Sector

Health and Safety Executive

Legend

Each item gives an indication of installation costs, broken down into 3 categories and is listed below. It does not consider ongoing costs associated with the maintenance and upkeep of the equipment:

£	Low (up to 5k)
££	Medium (5 – 10k)
£££	High (over 10k)

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Whilst we have considered ways to eliminate and mitigate falls from height, another key consideration is to provide safer access to vehicles should access be absolutely necessary.

Section 1.

Eliminating and Mitigating Risk of Falls from Height




Automated Netting System


Overview	The Automated Netting System is a trailer mounted hydraulic system that allows the driver to operate a load restraining net from ground level. The system suspends a net across the length of the vehicle by a tightrope. Once deployed the net is lowered onto the load and secured to the vehicle to contain the load in transit.	
Control Measure	Preventative	
Cost	££ (per system)	
Protection	Load Restraint	YES
	Load Containment	YES
	Driver Protection	YES
Usefulness	Eliminates the need for the driver to access the trailer to deploy netting across the load. Can be controlled/operated from the side of the vehicle.	

ADVANTAGES

- Load restraint webbing straps are integrated into the netting, which provides load containment.
- Allows the driver to access and deploy the system from the side of the vehicle.
- Eliminates the need to access the trailer to deploy load restraint/containment equipment.
- Can be retrospectively fitted and manufactured to suit all different trailers.
- Can be utilised at all different sites (multi drop, home delivery, construction sites, builders' yards).
- Easily deployed and retracted.

DISADVANTAGES

- May be expensive to fit to vehicles, depending on application and system type.

COMMENTS

- Requires additional training and instruction due to the controls being electronically and hydraulically operated.
- Periodic maintenance required.
- Does not eliminate the need to access off-loading equipment (e.g. HIAB, vehicle mounted crane).
- Additional load restraint may be required, dependent on load configuration.

Load Lock System


Overview	The Load Lock System is an internally fitted sheeting system built into the roof of curtain sided trailers. The sheets can be manually pulled down to cover the load and then secured to the body of the trailer for containment of the load in transit.	
Control Measure	Preventative	
Cost	£ (per system)	
Protection	Load Restraint	YES
	Load Containment	YES
	Driver Protection	YES
Usefulness	Eliminates the need for the driver to access the trailer to deploy nets/sheets across the load. Can be controlled/operated from ground level.	

ADVANTAGES

- Allows the driver to access and deploy the system from the side of the vehicle.
- Eliminates the need to access the trailer to deploy load restraint/containment equipment.
- Can be retrospectively fitted. Relatively inexpensive to install.
- Can be utilised at all different sites (multi drop, home delivery, construction sites, builders yards).
- Easily deployed and retracted.
- Does not require a high degree of training in use.
- Useful for containment of irregular shape and fragile fitments.
- Sheeting made from Kevlar – tough, durable and easily inter-changeable.

DISADVANTAGES

- Deployment of the system can be time consuming, dependent on the load configuration.

Soft Landing System

Overview	The Soft Landing System is a form of collective protection and although it does not eliminate the driver/operator from falling from the bed of the trailer, it is designed to catch the person and act as a 'crash mat' to reduce the likelihood of injury from an impact with the ground.	
Control Measure	Mitigative	
Cost	£ (per system)	
Protection	Load Restraint Load Containment Driver Protection	NO NO YES
Usefulness	Due to its light weight, the system is easily moveable and requires little manual handling. There is no requirement for the system to be permanently in place and can be set up as and when required providing an area is large enough to accommodate a HGV with sufficient space around the vehicle to deploy the system.	

ADVANTAGES

- Can be used at building sites, collection sites and builders' yards.
- Very low cost and minimum maintenance required.
- Waterproof and flame-retardant.

DISADVANTAGES

- Although deployable and manoeuvrable, the operation is time consuming to set up and remove for individual lorry delivery.
- Due to the bulkiness of the bags it is not a practical option to transport along with the load and set up at each individual point of delivery (i.e. home/residential POD).
- Unsuitable for fork lift operations. Could possibly be used with telehandlers due to the extent of the area surrounding the trailer bed.
- A large number of the bags are required to fit together to offer protection. This is time consuming and also adds to the area required to set up the system.
- A safe path to access the trailer is restricted due to the width of the bags. Also due to their composition the bags are difficult to walk over and although offering protection against falls from height, could lead to slips and trips, especially during rain or wet conditions.

Inertia Fall Arrest System


Overview	The Inertia Fall Arrest System is a harness based system that is attached to internal rail within a vehicle or an external gantry rail system (see page 8). It allows the operator to walk around the bed of the vehicle. If he falls the system works like a seat belt and after a short distance (approximately 15 cm) locks to prevent the operator from falling any further.	
Control Measure	Mitigative	
Cost	Vehicle mounted - £ (per system) Fall arrest gantry - ££ (per system)	
Protection	Load Restraint Load Containment Driver Protection	NO NO YES
Usefulness	It provides freedom of movement around the bed of the trailer, as the anchorage slides along the rail.	

ADVANTAGES

- Can be retrospectively fitted to both sides of a curtain sided trailer (nearside/offside).
- Provides protection for the operator and reduces the distance that they can fall..

DISADVANTAGES

- Could be fitted to flat bed trailers however, would incur high cost and would also limit loading access (FLT). Would also restrict load space area.
- All components of the fall arrest system require regular testing and inspection

COMMENTS

- Users require specific training in the use, inspection and fitment of the system and harness.
- The area would require to be monitored so that in the event of an accident, a rescue plan is in place to prevent the operator from causing further injury by delaying recovery/administering first aid.
- Would require regular maintenance and inspection.

Fall Arrest Gantry System

Overview	The Fall Arrest Gantry consists of a substantial steel structure to which a fall arrest block is mounted via an overhead rail system. The person accessing the vehicle wears a harness and connects up to the cable of the fall arrest block.	
Control Measure	Preventative	
Cost	£££ (per system)	
Protection	Load Restraint Load Containment Driver Protection	NO NO YES
Usefulness	It offers operators the ability to access the trailer bed without the risk of falling from height.	

ADVANTAGES

- Can be used with different sizes of vehicles and different load configurations.
- Good level of visual compliance.

DISADVANTAGES

- Costly to install.
- Requires a fairly large area to use. Can cause congestion at peak collection times due to the tail back of vehicles waiting to use the facility.
- Only provides protection at the site it is fitted.
- Requires individuals to be trained on the fall arrest system.
- The fall arrest block and harnesses required regular inspections and tests.

COMMENTS

- A rescue plan is required
- Driver is not in charge, the responsibility will fall onto the customer. The equipment will be owned by the customer and managed by site staff.

Platform Gantry System

Overview	The Platform Gantry system comes in the form of a deployable or fixed platform that will reduce the severity of injury should a person trip and fall whilst on the bed of his vehicle. This is due to the distance of the fall being greatly reduced. The vehicle is either driven in and a section lowered to reduce the gap between the load and the gantry, or reversed into the gantry and the gantry itself pushed in to close the gap as required.	
Control Measure	Mitigative	
Cost	£££ (per system)	
Protection	Load Restraint Load Containment Driver Protection	NO NO YES
Usefulness	It offers operators easy access to the trailer bed or load and reduces the distance a person would fall, and therefore the likely severity of any injury should a fall occur.	

ADVANTAGES

- Allows drivers to both net and strap the load generally without the risk of falling a distance likely to cause a serious injury.
- Allows drivers to view the load from above as opposed to from ground level. Allows greater ease of movement around the trailer.
- Can be operated by either manually or via a hydraulic mechanism (drive through gantry).
- Allows easy access to the trailer bed and load.

DISADVANTAGES

- Quite costly to install.
- Requires a fairly large area to use. May cause congestion at peak collection times due to the number of vehicles waiting to use the facility.
- Needs to be configured to match the height of the load. Significant differences in load height will reduce its effectiveness.
- Requires training for the use of the hydraulically operated system
- The drive-through system does not prevent falls from the rear of the vehicle when a trailer mounted crane is not in position to cover this area.

COMMENTS

- Driver is not in charge, the responsibility will fall onto the customer. The equipment will be owned by the customer and managed by site staff.
- Only provides protection whilst on site where the system is installed.

Remote Control Crane

Overview	The remote control crane eliminates the need for a driver to access the normal vehicle mounted crane, which involves working at height.
Control Measure	Preventative
Cost	££ (per system – over and above the cost of a normal crane)
Protection	Load Restraint NO Load Containment NO Driver Protection YES
Usefulness	The remote control unit, reduces the need for the driver to access the vehicle to operate the crane. It reduces the need to work at height and also offers the operator the ability to move around the area.

ADVANTAGES

- No requirement for access to the trailer whilst operating the crane.
- Operator at a safe distance so as to not be effected by mechanical failure (e.g. hydraulic hose burst, crane overturning).

DISADVANTAGES

- The operator does not have a ‘birds eye’ view of the load whilst attempting to place grab rails around the product thus could either damage product or misplace rails.
- Although very manoeuvrable, the operator would require a specific degree of training as there is a potential to overlook any ground level hazards and any other vehicles sharing that workplace.
- Operator could slew load overhead whilst attempting to reach the unloading point.

COMMENTS

- Does not affect payload of the vehicle. It is the same weight as a vehicle mounted top seat crane.
- Does not remove the need for the driver to access the trailer to deploy nets/secure the load.

Curtain and Net Sides


Overview	Curtain sides or net sides can be fitted to flat bed trailers and are a lightweight equivalent to ‘drop sides’. They can be retrospectively fitted.	
Control Measure	Preventative	
Cost	£ (per system)	
Protection	Load Restraint Load Containment Driver Protection	NO NO YES
Usefulness	Curtain sides are easy to install and operate and require minimum training in their use.	

ADVANTAGES

- Low cost and retrospective fitment available.
- Due to lightweight is easily used and operated and requires a small amount of training.

DISADVANTAGES

- Does not offer any protection to the restraint of the load (not rated to any BS EN standard).
- If the height of the load exceeds the height of the curtain/net side, no protection is offered to the containment.

COMMENTS

- Additional load restraints will be required to comply with the DfT Code of Practice.

Aluminium Drop Sides

Overview	Aluminium Drop Sides offer limited protection to both the side of the vehicle and the product. Although fairly weighted, the sides can be opened and closed in a short space of time and can be operated from ground level.	
Control Measure	Mitigative	
Cost	££ (per system)	
Protection	Load Restraint Load Containment Driver Protection	NO YES YES
Usefulness	The sides can be used to contain the load providing that it is lower than the height of the side. The sides (when in the 'up' position) offer a physical barrier to drivers working on the vehicle and prevent them from stepping off the side of the trailer.	

ADVANTAGES

- Offer limited protection/warning to a driver working on the rear of the vehicle.
- Offer containment of the load provided that the height is less that that of the sides.
- Very little training involved.

DISADVANTAGES

- Does not offer restraint of the load.
- Possible manual handling issue to the driver due to the weight of the sides.
- Susceptible to damage during loading operations (by FLT).
- Risk of damage to vehicle if moved whilst the sides are still down.

COMMENTS

- Additional load restraints will be required to comply with the DfT Code of Practice.

Corner Boards and Edge Protection


Overview	Corner Boards and Edge Protection increase the effectiveness of the load restraint strapping which can be deployed from ground level, reducing the need to work at height on the trailer bed. They offer protection to both the product and the retaining straps used to secure the load. They prevent the straps from abrasion and also the product from damage. They are lightweight and easily handled.	
Control Measure	Preventative	
Cost	£ (per system)	
Protection	Load Restraint	YES
	Load Containment	NO
	Driver Protection	YES
Usefulness	The corner boards and edge protection are very lightweight and easily moveable. Made from aluminium or tinplate, they require very little maintenance and have a good lifespan.	

ADVANTAGES

- Inexpensive system to use and replace.
- Requires very little training in their use.
- Easily deployed and easily checked to ensure the tension has not slackened.
- Minimises the need to climb over the load. Can be deployed from the side. A tool can be sourced to apply the cornerboards from ground-level for those pallets which are out of reach.

DISADVANTAGES

- Although it restrains, these items do not contain the load and hence would be better used in conjunction with netting. However, the driver would need to access the load to deploy any nets.

COMMENTS

- The weight and configuration of the load would determine the amount and distribution of restraint straps and corner boards to comply with the DfT Code of Practice.

Load Spacers



Overview	Where a gap is required for mechanical off load, Load Spacers provide protection to the load whilst in transit. They fit between the product and act as a buffer to stop the load from shifting during travel.	
Control Measure	Preventative (if spacers deployed by crane)	
Cost	£ (per system)	
Protection	Load Restraint	NO
	Load Containment	YES
	Driver Protection	YES
Usefulness	Prevent the load from moving in transit thus maintaining the integrity of the load security equipment.	

ADVANTAGES

- Inexpensive system to use and replace.
- Requires very little training in their use.
- Adds protection to the load and integrity to the load security equipment.
- Can be inserted/removed by mechanical means eliminating the need for the driver to access the trailer bed.

DISADVANTAGES

- Not always feasible to use mechanical equipment to put in place. Driver may still need to access the trailer.
- Additional load restraints will be required to comply with the DfT Code of Practice.

COMMENTS

- An example of a system to enable load security avoiding the need to net or sheet the load, therefore the need to access the bed of the trailer. Using Load Spacers, straps can be deployed from ground level.

Section 2.

Access to Vehicles




Side Protection Steps

Overview	The Side Protection Steps system is built into the side of the vehicle and when not in use folds away. It offers side protection to the vehicle and also steps to access the side of the trailer without having to get on to the rear of the trailer.
Control Measure	Mitigative
Cost	££ (per system)
Usefulness	The system offers protection to the side of the trailer and also gives the driver the ability to access the sides of the load without the need for accessing the bed of the trailer.

ADVANTAGES

- Requires very little training in the use of the system.
- Offers the driver access to the sides of the load from ground level without the need to access the rear of the trailer.
- Can be retrospectively fitted at varying heights and widths.
- Can be utilised at all different sites (multi drop, home delivery, construction sites, builders yards).
- Easily and quickly deployed and retracted.

DISADVANTAGES

- Could present a possible manual handling risk depending on the size and weight of the steps.
- Still poses a working at height issue although the distance to ground level is considerably less than working from the bed of the trailer. Operator would need to be made aware of the risk during training.

COMMENTS

- Depending on the height of the load, may not offer sufficient access from the side and the driver may still require access to the bed of the trailer.
- Could cause potential danger if not retracted properly prior to or during vehicle movement.

Rear Step Access



Overview	The rear step access is integrated into the body of the trailer and can be deployed and retracted at will. The steps offer access from the rear of the vehicle onto the trailer bed.
Control Measure	Mitigative
Cost	£ (per system)
Usefulness	The steps offer safe access to the rear of the bed of the trailer.

ADVANTAGES

- Requires very little training in the use of the system.
- Affords safer access to the rear of the trailer bed.
- Can be retrospectively fitted to most trailers. Different versions of the steps can be installed.
- Can be utilised at all different sites (multi drop, home delivery, construction sites, builders yards).

DISADVANTAGES

- Although the steps offer access to the rear of the trailer, if laden access is restricted.

COMMENTS

- Drivers may still require access to the rear to attend the load. Although safe access is afforded, it does not eliminate the risks of working on or around the load.

Rear Steps and Platform Access

Overview	Rear Access Steps provide a walkway from ground level to the rear of the trailer. They provide a safe working platform to the rear of the vehicle which is complete with edge protection.
Control Measure	Preventative and mitigative
Cost	££ or £££ (depending on modification)
Usefulness	The steps offer protective safe access to the rear of the bed of the trailer.

ADVANTAGES

- Requires very little training in the use of the system.
- Offers the driver an eye level view of the load without the need to climb over it.
- Can be retrospectively fitted to most trailers.
- Can be utilised at all different sites (multi drop, home delivery, construction sites, builders yards).

DISADVANTAGES

- Although it does not interfere with the length of the vehicle, the modification affects the load by cutting down the amount of space available and adding to the weight of the vehicle, reducing its payload. However, it is likely/possible that the chassis would be lengthened to accommodate the platform and thus would NOT reduce the load area.

COMMENTS

- Drivers may still require access to the rear to attend the load. Although safe access is afforded, it does not eliminate the risks of working on or around the load.
- Depending on the height of the load, may not offer sufficient access from the side and the driver may still require access to the bed of the trailer.

Trailer Bed Access Ladder

Overview	The Trailer Bed Access Ladder is a detachable ladder that can offer access to the vehicle bed from either side and at various positions along the trailer.
Control Measure	Mitigative
Cost	££ (per system)
Usefulness	The ladder is detachable and can be moved along the sides of the trailer to where access is best afforded/needed. It can be stowed away under the body of the vehicle in a secure compartment.

ADVANTAGES

- Requires very little training in the use of the system.
- Offers the driver access to the sides of the load from ground level without the need to access the rear of the trailer.
- Can be retrospectively fitted and manufactured at different lengths. Can also be adapted to any angle from the ground to vehicle bed to gain access.
- Hand rails can be constructed to different height levels above the top step of the ladder.
- Can be utilised at all different sites (multi drop, home delivery, construction sites, builders yards).
- Easily and quickly deployed and retracted.

DISADVANTAGES

- Still poses a working at height issue. Operator would need to be made aware of the risk during training.

COMMENTS

- Depending on the height of the load, may not offer sufficient access from the side and the driver may still require access to the bed of the trailer.

Acknowledgements