

Tail Lift

Specification Guide for Road Vehicles



Produced by The Ray Smith Group Plc
in conjunction with SOE IRTE



SOE (Society of Operations Engineers)

SOE is a professional membership organisation that represents more than 18,000 individuals and companies in the engineering industry. It encourages best practice, health and safety initiatives, and is committed to the ongoing growth and personal development of its members, through specialist knowledge sharing and professional learning.

The SOE has three Professional Sectors; IRTE (Institute of Road Transport Engineers), IPlantE (Institution of Plant Engineers) and BES (Bureau of Engineer Surveyors). Whilst SOE has a collective and central role for its members, each of the Professional Sectors remains dedicated to developing the skills of its members in their specialist areas of activity.

The SOE's aim is to be recognised world-wide by all of our stakeholders as being the most relevant and professional organisation; to continually deliver best practice amongst engineering individuals and their related companies.

A Licensed Member of EC^{UK}, SOE is able to nominate members with the required qualifications to all three sections of EC^{UK}'s national register of engineers.

For more information about SOE visit our website at www.soe.org.uk



IRTE

The IRTE (Institute of Road Transport Engineers) was founded in 1944 and is one of the most respected names in UK transport, with an acknowledged role as the impartial voice of the industry.

Its remit is to encourage ever higher standards of excellence from a unique and independent standpoint. Safety in operation is a key priority and IRTE has an industry leading role in this respect. Recent initiatives have included research into tipper stability, wheel loss prevention and assisting its members in understanding corporate liability.

IRTE publishes the industry respected monthly magazine *Transport Engineer*, as well as a range of technical guides. IRTE is a partner in the CV Show, the UK's most successful commercial vehicle exhibition. It aims to assist the road transport industry in overcoming skills shortages and pioneered the IRTEC Licensing Scheme for technicians and mechanics.



Foreword

The Institute of Road Transport Engineers (IRTE) is a professional body dedicated to promoting the good practice that should be adopted by its own members, and by industry as a whole, on a range of subjects. Since 1944, the IRTE has been the impartial voice of the industry on many matters connected with the safe design and use of vehicles. The Tail Lift Specification Guide for Road Vehicles is the latest piece of work in this tradition.

Although we would all agree that the subject of tail lifts is already extensively covered by regulation and standards, specifically, BS EN 1756-1:2001 and BS EN 1756-2:2004, these documents are very technical, not easy to understand or interpret and not readily available to the specifier and user. This guide sums up the relevant information contained within the regulations and standards, whilst interpreting them in a more accessible and user friendly form.

The guide is intended to make clear to manufacturers, specifiers, installers, suppliers and users of tail lift equipment what safety considerations the various regulations and standards require, in terms specifically related to their use. The guide may be particularly useful to specifiers and users as it recognises that their responsibilities for the specification and aftercare of vehicle mounted tail lifts are often unappreciated and unfulfilled.

I am pleased that HSE has been able to contribute to the production of this guide and I am sure that you will join me in thanking all of those responsible for this publication and for their hard work.

Elizabeth M. Gibby

Dr Elizabeth M Gibby
Director of Injuries Reduction Programme
Health and Safety Executive



Introduction

A tail lift is a highly regulated piece of ancillary equipment for fitment to a vehicle. Tail lift manufacturers, specifiers, installers and suppliers have a legal duty to ensure that tail lifts are constructed and installed to appropriate standards and that they are supplied with information to allow them to be used safely. Each party in the supply chain has a vital role to play in the provision of a tail lift to ensure its safety in use.

The 'Supply of Machinery (Safety) Regulations 1992', amendment 1994 is a mandatory regulation to which equipment must be supplied. Once the tail lift

equipped vehicle has been delivered the requirements of the 'Provision and Use of Work Equipment Regulations, 1998' (PUWER) and the 'Lifting Operations and Lifting Equipment Regulations, 1998' (LOLER) apply.

This guidance is provided to help manufacturers, specifiers, installers, suppliers and users understand their legal duty and the issues that can affect the safety of the installed product and its compliance with health and safety legislation.

Definitions

Manufacturer

The body or person that designs and constructs the tail lift.

Specifier

The body or person that provides a specification for the characteristics of the tail lift, for an application or applications, to meet the user's requirements.

(NOTE: - The specifier may be the user or someone with the necessary competence, employed by the user to draw up the specification).

Installer

The body or person that fits the tail lift to the vehicle.

Supplier

The body or person that provides the vehicle and tail lift combination to the user.

User

The owner or operator of the vehicle who has responsibility for the safe use of the tail lift.

The Responsibilities of the Tail Lift Manufacturer

The 'Supply of Machinery (Safety) Regulations 1992' (as amended) details legal duties that apply to all parties in the tail lift supply chain. Guidance on how to implement the essential safety requirements of these regulations is provided by European standards, adopted in the UK by the British Standards Institute (BSI). These standards are referenced BS EN 1756-1:2001 and BS EN 1756-2:2004. Tail lifts that are CE marked and supplied with a 'Declaration of Conformity' referencing the standards can be presumed to comply with the essential safety requirements of the regulations.

BS EN 1756-1:2001 specifically covers tail lifts for goods, whether accompanied by an operator or not. However, it should be noted that any tail lift that can rise to a height in excess of 3 metres, does not fall within the scope of BS EN 1756-1:2001 and that the 'Supply of Machinery (Safety) Regulations' places additional requirements on manufacturers and suppliers for the supply of this type of equipment.

BS EN 1756-2:2004 covers the additional requirements for tail lifts used specifically for passengers, including those with disabilities.

Adopting the CE philosophy should provide a uniformly compliant product. However, as with all legislation, 'interpretation' and 'compliance' are often taken to mean very different things by individual manufacturers and their country of origin. This may result in a product being deemed to comply in its home market but not in others. It is the moral duty of a responsible manufacturer to ensure that the products they supply will

stand the rigours of scrutiny in the market into which they are sold and will not place the operating company in a technically vulnerable position.

When considering the tail lift specification as a whole it is necessary to think beyond BS EN 1756 and the basic requirement of a tail lift to move goods and/or passengers to and from the ground in safety. Manufacturers usually have a standard range of products from which models are derived to suit a particular requirement, however, it is highly likely that the manufacturer will have little or no knowledge of the application in which their product is to be used. Therefore, it is critical that the manufacturer is made aware of any operating conditions that may adversely affect the product or its ability to be operated safely.

In complex applications some manufacturers will be incapable of providing a total solution. In these instances the specifier must assume responsibility or enlist the assistance of a suitably qualified specialist.



A typical underfloor stowing tail lift.

The Responsibilities of the Installer

The installer is a key link between the manufacturer and the user and is responsible for the correct fitting of the tail lift to the vehicle so that it is safe in use.

All tail lifts in the European Union must be CE marked. In the majority of cases, where the tail lift is supplied as an independent unit which is attached to the vehicle, the manufacturer will CE mark the tail lift and supply a 'Declaration of Conformity' with suitable information so that it can be installed properly and maintained to ensure its safety in use. The manufacturer does not CE mark the vehicle and tail lift combination. Where the tail lift is structurally integrated with the vehicle or has been supplied as an unassembled kit of parts and the safety and operation of the tail lift is dependant upon this integration or assembly, then the manufacturer should issue a 'Declaration of Incorporation' and should not CE mark the tail lift. The installer will, when the tail lift has been installed, ensure compliance with the essential health and safety requirements of the 'Supply of Machinery (Safety) Regulations' and then CE mark the tail lift. Note:- The installer is not CE marking the vehicle just the tail lift.

The manufacturer rarely controls the installation of the tail lift. As a result, a key requirement to ensure safety is for the installer to fit the tail lift according to the manufacturer's instructions.

When carrying out an installation, all of the parts provided should be fitted as specified by the manufacturer. It should also be noted that failure to follow the manufacturer's instructions can make the tail

lift unsafe in use and invalidate its CE marking.

Apart from the requirements of the tail lift manufacturer, the installer must also work to the specifications laid down in the chassis manufacturer's manual covering the fitment of ancillary equipment.

Integration of the tail lift with the bodywork is critical to the compliance of the tail lift. If the correct interface is not achieved the tail lift may be unsafe and non compliant.

The responsibilities of the installer, as outlined in BS EN 1756 Parts 1 and 2, extend beyond attaching the tail lift assembly to the vehicle. For example, once installed the tail lift must be weight tested as directed by the manufacturer and a copy of the 'Weight Test Certificate' provided to the user. In addition to the 'Weight Test Certificate' the user should be provided with an operators handbook, maintenance instructions and inspection safety check lists appropriate to the model and type of tail lift. The installer must also fit a warning device that indicates to the driver of the vehicle, whilst sitting in the normal driving position, when the tail lift is in its correct stowed position.

Having installed and weight tested the tail lift; the next consideration is compliance with the 'Road Vehicles (Construction & Use) Regulations' which apply to the vehicle as a whole. The most common areas requiring attention are the positioning of lights, number plate and rear under-run protection.

The Responsibilities of the Installer

The vehicle should not be CE marked under the 'Supply of Machinery (Safety) Regulations', as a result there is no need to supply either a 'Declaration of Conformity' or a 'Declaration of Incorporation' under these regulations. However, the 'Health and Safety at Work Act, 1974, Section 6' applies and it is important to be able to demonstrate that the tail lift can be used safely in conjunction

with the vehicle. One way of doing this is to demonstrate that the essential safety requirements of the 'Supply of Machinery (Safety) Regulations' are met but not refer to the regulations in any associated documentation; however it would be expected that the tail lift itself must be CE marked.



Complex installations demand a high level of detailed design engineering to achieve a successful result.

Along with the manufacturer, the installer is likely to be unaware of the constraints imposed on the tail lift by operational requirements, therefore the installer should fit the tail lift as directed by the manufacturer. The installer should however check the vehicle to which the tail lift is to be installed, to ensure that it conforms with the specification detailed in the information provided with the tail lift fitting instructions.

Any discrepancies in specification which may adversely affect the operation of the vehicle and tail lift or compromise safety must be advised to their customer. It is also reasonable to expect the installer to use their experience to identify and advise their customer of any real or perceived shortfall in the overall specification of the vehicle and tail lift combination which may compromise utilisation or safety.

The Responsibilities of the Specifier

The 'Provision and Use of Work Equipment Regulations, 1998' (PUWER) and the 'Lifting Operations and Lifting Equipment Regulations, 1998' (LOLER) are concerned with the safe use of tail lifts. These regulations place duties on the specifier to select equipment that can be used safely to carry out the tasks that it is expected to perform.

People who specify tail lifts for different applications need to identify the characteristics required of those tail lifts, taking account of their expected uses and the vehicle or vehicles to which they are fitted.

The compilation of an appropriate tail lift specification for any given application will be largely determined by a 'Risk Assessment' of what the tail lift is intended to be used for, how it is likely to be used and how it could be misused. This will involve producing a list of features required to carry out the intended function and the risks associated with its likely use and misuse.

The following is a basic list of considerations, however it is not intended to be definitive, as many applications are unique and will demand an extended thought process to determine the correct specification.

Tail lifts fall into two basic categories, column and cantilever. Albeit that these tail lifts have totally different operating principles, their construction is regulated by the same safety legislation and as such they must be viewed in the same way when considering specification.

Given the fundamental differences in design

and operation, one style of tail lift may be more suited to a specific application than the other and there will be differing safety issues to consider.

The maximum load and how it is handled will dictate the tail lift capacity required. When making this calculation, consideration must be given to the total weight to be lifted, including the load, any handling equipment, i.e. pallet, stillage, pallet truck, etc, plus the operator or operators.

The position of the load on the platform will affect the capacity of tail lift required. Every tail lift with a platform depth exceeding 1200mm must have a 'load centre' indicator on the platform to mark the maximum distance from the heel of the platform, nearest the bodywork, where the centre of gravity of the maximum permissible load can be lifted. It is important to consider the position of the load because moving the 'load centre' outwards away from the vehicle bodywork will reduce the capacity of the tail lift, as may any sideways movement from the centre line of the vehicle, details of which will appear on the manufacturer's capacity chart.

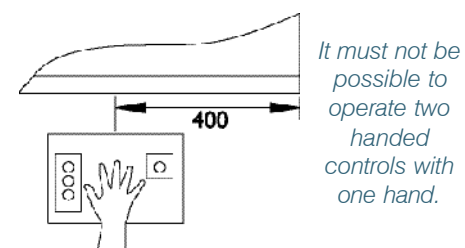
The tail lift platform size must be large enough to accommodate the load, any handling equipment and the operator safely. The operator should have sufficient space in which to work when positioning the load on the platform. The controls should be positioned and constructed so that the operator can use them in safety when on the platform or from a position adjacent to the platform.

Controlling the functions of the tail lift is an

The Responsibilities of the Specifier

often neglected but very important issue which, if incorrectly specified, can create a situation where the operator is positioned in a place of danger. The external position of the controls is dictated by the tail lift standard and should be addressed by the manufacturer and installer. However, due to reasons of interpretation or fitment; this requirement may not be met.

Depending on the style of tail lift, the external controls, whose centre line must be 400mm from the rear of the body, will be either one or two handed depending on the functionality of the tail lift and the possibility of the operator endangering themselves by 'Crushing or Shearing' whilst the tail lift is in use. For instance, from the control position could the operator trap any part of their person, i.e. head, hand, arm, leg, foot, etc?

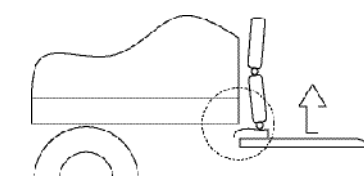


It must not be possible to operate two handed controls with one hand.

The section of the standard dealing with controls, can be and often is, interpreted in a manner that will either leave the operator exposed by failing to meet the requirement or place the onus onto a third party, e.g. bodybuilder. As a consequence, the specifier should be aware of the need to have controls that are easily identifiable and whose function and position will prevent injury to the operator.

The methods employed to prevent foot

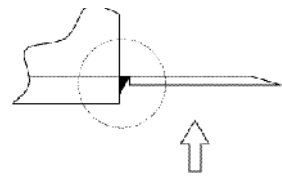
trapping, that are many and varied, normally being mechanical or electro mechanical, must comply with the standard. In many applications a mechanical solution is acceptable; however this is not always possible. Under these circumstances, alternative safeguarding methods must be provided. For example, a pressure sensitive strip to arrest platform movement or foot controls to restrict movement of the operator. Every specifier has a duty to consider the safety of the installed tail lift, and as a result, they should be mindful of the essential safety requirements of the 'Supply of Machinery (Safety) Regulations 1992, Schedule 3, Annex 1, Principles of Safety Integration'. These requirements mean that doing nothing or providing labelling is not sufficient to protect against foot trapping because physical safeguards are widely available and are used on tail lifts to protect against the risks involved. For example, when the tail lift is being raised and is approaching the body rear bearer, what measures have been taken to prevent the operator trapping their feet between the platform and bodywork?



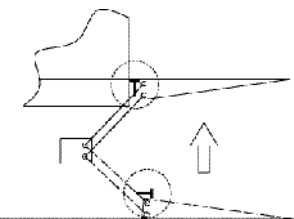
This guillotine action fails to address the dangers of crushing and shearing.

The use of foot controls is just one method of protecting the operator; however, they do not protect a second person. The position of the controls is regulated, being a minimum of 250mm from the platform heel, with the same minimum distance between each button.

The Responsibilities of the Specifier



Example of a preventative measure acceptable for use on a column tail lift only.



Example of a preventative measure for use on a cantilever tail lift.

The use of any type of remote and wander lead controls is problematic as by their nature they allow the operator to move about freely, so their functionality and location must be controlled to ensure that the operator is not endangered. By using this type of remote control the operator can place part of his person in a potentially dangerous situation that would not be possible from a fixed control position.

The interaction between multiple control positions must also be such that it ensures the operator maintains control of the tail lift at all times from a single active control position and that the control cannot be overridden. For example, if the operator is inside the body, the design of the controls must be such that they prevent a second person outside the vehicle from taking control, thus ensuring the safety of the operator.

Both electrical power and control circuits

must be protected which, in the case of the power feed to the tail lift, would normally be achieved by the inclusion of either a fuse or overload trip which must be sited as close to the battery as is practicable. It must also be possible to isolate the tail lift from the battery, which can be as simple as disconnecting the power cable from the battery. The operation of the control circuits must work on the 'hold to run principle' and also be protected to prevent unauthorised operation in the absence of the operator. This can be achieved in a number of ways, including the use of a switch positioned in the cab or a locking isolator next to the tail lift controls.



Typical two tier tail lift complete with safety hand rails and three-way ramps.

All tail lifts that achieve a raised height of 2 metres or greater must be provided with safety hand rails on all exposed sides. These rails must be a minimum of 1100mm high with a maximum of 500mm free vertical space between rails. No space between an interrupted hand rail may exceed 120mm other than by the use of a self closing gate. Load test rules apply to the hand rail design which must be adhered to. On this type of tail lift, an automatic visual and audible warning should be made when the lowering control is activated. Consideration should be given to the inward facing aspect of the

The Responsibilities of the Specifier

platform which may also require safety protection for the operator on the platform and/or anyone within the body.

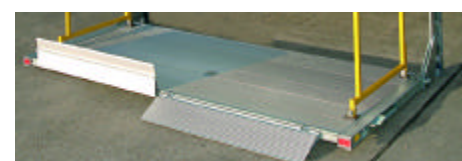
The result of the 'Risk Assessment' carried out on the application in question, may demand that safety hand rails are fitted to a tail lift operating at a lower height.

The manual effort required to operate any part of the tail lift shall not exceed 250N, however the effort required initiating movement can be up to 350N.

The operating speeds of the tail lift is governed in all respects other than those requiring manual effort, therefore the operator should not adjust these speeds without consultation with the manufacturer. For reference purposes, the maximum vertical speed shall not exceed 150mm per second and the opening and closing speeds for power closure tail lifts must not exceed 10° per second. Other speed restrictions may apply depending on the functionality of the tail lift in question.

An operator on a platform must not be able to cause the platform to tilt greater than 10° to the horizontal except at ground level.

Stops with a 50mm minimum height must be provided to prevent loads unintentionally rolling off the platform if the tail lift is used for the lifting or lowering of wheeled loads.



Typical example of wheeled load restraint.

The area of work should be adequately illuminated to provide a safe environment. For instance, would it be appropriate to install additional lighting to the rear of the vehicle to illuminate the tail lift and surrounding area?

The tail lift platform shall be equipped so as to be seen from the sides and rear, day or night. For example, the use of reflective materials such as flags and stickers or lights are common solutions.

On completion of the specifying process, it is prudent to verify the initial 'Risk Assessment' to ensure that the tail lift is compliant in all respects, particularly in respect to 'Crushing and Shearing' as not all dangerous situations are immediately apparent.

Due to the intimate knowledge of the users operational requirements it is incumbent upon the specifier to advise the manufacturer of their expectations, as the design of the tail lift may have to be modified to achieve compliance. For example, is a specific departure angle required behind the rear axle to accommodate unusual ground conditions? Is the tail lift to be intensively used and if so what power source is being provided and where is it located relative to the tail lift power pack? If fitted to a vehicle towing a drawbar trailer, who will take responsibility for working out the geometry and interface between tail lift, hitch, towing beam and other ancillaries? Due to the nature of the load, is additional restraint required whilst the platform is in motion? Is the specifier the project manager and, if not, who is?

The Responsibilities of the User

The 'Provision and Use of Work Equipment Regulations, 1998' (PUWER) and the 'Lifting Operations and Lifting Equipment Regulations, 1998' (LOLER) cover the safe use of tail lifts. They place duties on users to operate, maintain and examine tail lifts to ensure their safety in use.

On taking receipt of the equipment, the user should satisfy themselves that the tail lift meets the specification to which it was supplied.

The user should retain the manufacturer's 'Declaration of Conformity' or the installer's 'Declaration of Incorporation' for the term that the equipment is retained.

The tail lift should be maintained as specified by the manufacturer as doing so will be a condition of the warranty provided and failure to do so may affect any claims.

The manufacturer's recommended service intervals should be considered as the minimum requirement and as such the user should review their operation to determine if additional servicing should be carried out. For instance, is utilisation of the tail lift exceptionally high, is the tail lift hardly ever used or is it frequently pressure washed? Any of these scenarios may demand additional servicing.

The user should maintain records of servicing and any exceptional inspections, breakdown repairs and major repairs. With regard to breakdown repairs, it is important that the operator acts on the repairers report. Many roadside repairs are only temporary and are not intended to be a

permanent fix or may involve the disabling of electrical circuits and safety devices.

Twice a year the user must ensure that the tail lift is subjected to a 'Thorough Examination' to comply with the LOLER regulations. Six monthly 'Thorough Examinations' are required on a tail lift that can carry a passenger and, as very few applications will not be capable of carrying a passenger, the 'Health and Safety Executive' is likely to treat with caution any claim that there is no opportunity to travel on the tail lift unless the operator is able to prove categorically that this is the case. This examination must be carried out by a competent person, who is empowered to provide a written report of 'Thorough Examination' and must be separate from any maintenance activity.

The completed LOLER report of 'Thorough Examination', which must be retained for a minimum of two years, will detail any work required to the tail lift and the time scale in which it must be carried out. It will also provide a chronological record of defects and the remedial work required within specified timescales. On receipt of the report of 'Thorough Examination' it becomes the legal responsibility of the user to ensure that any work required is carried out within the specified timescales.

An additional 'Thorough Examination' must be carried out following the repair of accident damage, a significant change to the specification of the tail lift or a major repair requiring the replacement of key components, for example ropes and chains, hydraulic cylinders, etc.

The Responsibilities of the User

After the initial weight test which is carried out when the tail lift is installed, there is no legal requirement to carry out further weight tests. However, the majority of manufacturers recommend that an annual weight test takes place. This weight test is an additional demonstration to all interested parties that the tail lift is safe to be used and is an indication that the tail lift is being maintained correctly. In some instances the manufacturer will require an annual weight test if the terms and conditions of their warranty are to be met.

The importance of tail lift operator training must not be underestimated. Training should be carried out by a suitably competent person and a training log should be maintained, with provision for recording the type of tail lift involved, the date on which training took place and the signature of the recipient confirming that the training has taken place. For example, do not assume that the employee can work the equipment correctly and understands the dangers involved or the effects of inappropriate load positioning, as this may not be the case in practise.

Users are required to ensure that operators follow safe practices when tails lifts are in use and to ensure they are properly maintained.



It is important that the operator understands the effects of both transverse and longitudinal load positioning and the use of the capacity chart supplied with the tail lift manufacturer's instructions.

The use of any type of remote and wander lead controls is problematic as by their nature they allow the operator to move about freely, therefore their functionality and location must be controlled to ensure the operator is not endangered. By using the remote control the operator can place part of his person in a potentially dangerous situation that would not be possible from a fixed control position. In the unlikely event that no other practical solution exists operators must be instructed in the use of remote and wander lead controls to avoid the risks associated with the moving tail lift.

The area of work should be adequately illuminated to provide a safe environment.



Above: A column tail lift with three-way ramps/rolling load restraints.
Left: A large flat platform cantilever tail lift with edge restraints and trolley stops.

Part Two - Requirements of Tail Lifts for Passengers

Part Two of the BS EN 1756 deals specifically with the special requirements of tail lifts used for passengers, including those with disabilities. The responsibilities

of the manufacturer should be viewed in the same way as those for Part One of the standard and be fully compliant in every respect.

There are a vast number of tail lifts in use on our roads that have to conform to BS EN 1756-2:2004, which, in the majority of cases

we do not give a second glance as they are such a common everyday sight.



Nationally one of the largest users of passenger tail lifts are Local Authority Social Service Departments, however numerous Clubs and Charities operate similar vehicles, all of which are required to conform to the same standards.

It is possible to think of many other applications which benefit from a tail lift to carry a person, such as a mobile Library, Bank, Clinic, Exhibition unit or even a Police Station.



Using a much wider thought process brings forth less obvious applications, such as the use of a tail lift on an ambulance, which can include those used for hospital patient transfer, for transporting a patient whilst confined to bed and even those dealing with 'Accident and Emergency' situations.

The Responsibilities of the Specifier

The requirements for a passenger tail lift are significantly more onerous than those for a goods tail lift. The indicated requirements for this type of tail lift are in addition to those of the goods tail lift.

As with all mechanical equipment of this type a 'Risk Assessment' must be carried out, paying particular attention to the fact that the operator / passenger using the tail lift may have limited mobility.

Due to the multiplicity of passenger tail lift designs and operating principles, reference to the British Standard may be necessary to determine if all aspects of the tail lift design being considered meet the requirements for a given application.

When selecting a tail lift for fitting to a vehicle the load and platform size requirements are dependent on the category of vehicle to which the tail lift is intended to be used and must conform to the following :-

| Category | Vehicle | Tail lift operator | Minimum lifting capacity | Minimum effective platform width | Minimum effective platform depth |
|----------|--|---|--------------------------|---|---|
| A | scheduled public transport EXAMPLES bus train | driver, responsible person or passenger | 300kg | 800mm | 1200mm |
| B | other public transport EXAMPLES minibus taxi ambulance | driver, or responsible person | 300kg | 800mm if compliance with 2001/85/EC is required, otherwise, 725mm | 1200mm - if, by design, provision is made for an attendant to ride on the platform, otherwise 900mm |
| C | Personally owned vehicles EXAMPLES cars vans | trained passenger or responsible person | 160kg | 700mm | 600mm |

A tail lift designed specifically for the lifting of passengers, including those with disabilities, must be equipped with additional features over and above those of tail lifts complying with Part One of this guidance.

consider the increased risks involved in the transportation of passengers, particularly those who may have impediments likely to make them more vulnerable to injury.

When specifying a tail lift of this type it will be necessary to extend the thought process beyond that of a commercial tail lift to

Given that the responsibilities detailed in Part One have been accommodated, the following additional issues must be addressed.

The Responsibilities of the Specifier

Generally all category 'A' & 'B' tail lifts travelling vertically in excess of 500mm should be equipped with two hand rails which ideally move with the platform, have a height of between 650 & 1100mm, a minimum cross section of 25mm, adequate grip and be finished in a contrasting colour. In some instances one hand rail may be acceptable; however a 'Risk Assessment' should be conducted to verify that decision.

Should fixed hand rails be utilised, these must cater for the full range of tail lift platform movement and provide easy access for both standing and wheelchair users.

In the case of a passenger controlled tail lift the manual effort required must not exceed 50N and the manual finger activation of the controls 5N. In other cases the manual effort to operate the tail lift shall not exceed 200N, however an effort of 250N is permissible to initiate movement.

The maximum vertical speed of the platform is 150mm per second as with a goods tail lift. When considering opening speeds there are no restrictions on platforms opened and closed by manual effort, however the maximum opening and closing speed for powered tail lifts is 200mm per second with a tilting speed not exceeding 4 degrees per second. Tail lifts where the platform rotates must be equipped in a manner that will prevent any sudden stopping at either end of their rotation arc, to prevent the passenger becoming unbalanced. As with all speed related issues an individual 'Risk Assessment' should be carried out to determine the most appropriate speed of operation for each application, as the

maximum limits may be too fast.

Tail lifts intended to carry a wheelchair must be equipped with a device to prevent it unintentionally rolling off the platform, however this rule should be extended to cater for any wheeled appliance. Category 'A' & 'B' tail lifts must be fitted with a mechanically operated device to provide a positive barrier at the toe of the platform. For category 'A' tail lifts the barrier must be at least 100mm high and automatic in operation. On category 'B' tail lifts the barrier must be at least 70mm high and shall be either automatic in operation, interlocked with the lifting and lowering functions or supported by an audible or visual warning system. Category 'C' tail lifts must have a barrier that has an effective height of at least 25mm, which may be either mechanical or fixed. In all cases the width of the device shall be sufficient to prevent a wheeled appliance inadvertently rolling from the platform.

If the platform has a width of less than 1200mm it must be equipped with full length side barriers of 25mm minimum height, to prevent wheels slipping off the edge.

The platform surface should be slip resistant and it must be easy to remove hazardous substances without causing damage to the surface.

With the exception of safety barriers, deployed stop devices and specifically; lights, stop device controls and foot controls, all of which must not exceed 25mm in height, the platform surface must be clear of all potential trip hazards and holes exceeding 15mm diameter.

The Responsibilities of the Specifier

Should the platform deploy over a pavement the tail lift must be equipped with lights or audible warning of operation to reduce the risk of injury to pedestrians.

The dangers from 'Crushing & Shearing' must be catered for, with particular attention being paid to the area between the heel of the platform and the vehicle floor as the platform approaches. The methods of achieving this requirement listed is not exhaustive, however the use of a 150mm minimum depth hinged protector attached to the platform is acceptable, as is the use of a body mounted hinged plate covering a 75mm minimum platform to body gap. The alternative to these is an electronic system of providing the appropriate protection.

Category 'A' & 'B' tail lifts must be equipped with a manually operated back up system capable of achieving all of the functionality normally available in the event of a failure. Category 'C' tail lifts only require a manually operated system capable of achieving opening and lowering movements.

Specific requirements exist controlling the type and position of the controls on a tail lift for passengers. These are very different to those for a goods tail lift. All controls must operate on the 'hold to run principle', however on a category 'A' or 'B' tail lift there is a permissible alternative providing that they meet a very stringent specification and include an automatic system to arrest movement should the tail lift come into contact with any part of the passenger or a

wheelchair, a responsible person must be able to see both the passenger and the surrounding danger area during operation and easily accessible stop buttons must be available to the passenger and responsible person.

All controls must be logically consistent with the movement generated, designed in such a manner which prevents unintentional operation and any control which initiates more than one movement simultaneously must have safeguards to prevent potentially dangerous conflicting movements.

If several control devices are required to initiate movement, i.e. two handed controls or foot controls, they must be positioned such that both hands or feet are required to initiate movement and the release of any one control will stop movement. The design must also prevent disabling of the safety system by the fixing of any control. The location of the controls should provide the operator with good all round visibility of the passenger, if they are not the operator, the platform and surrounding area. In the event that multiple control positions are provided conflicting commands must be prevented, with priority determined by taking into account the intended use of the tail lift. The operation, functionality, location and combination of controls on a tail lift for passengers is critical to the safety of the passenger, therefore the importance of the 'Risk Assessment' must not be underestimated.

The Responsibilities of the Installer

These are generally the same for any tail lift, however these responsibilities cannot be over emphasised as it is the installers understanding of the regulations, the quality of advice and the integrity of work carried out that go a long way to ensuring that the installation is safe.

Due to the subtle differences in the requirements over and above that of a goods tail lift, it is important that the installer appreciates and accommodates these differences when fitting the tail lift to ensure that it is safe to use.

Conclusion

All parties involved in the manufacture, specification and supply of a tail lift have a legal duty under health and safety law to ensure that tail lifts installed on vehicles are safe when used as intended and under foreseeable situations of misuse taking account of the applications for which they are provided.

Using their knowledge of tail lift design, the manufacturer should provide a product that meets current regulations and give the best advice possible to both the installer and user to ensure that the tail lift can be operated in safety once it is put into service.

The installer should employ best practice when installing the tail lift and ensure that it is fitted in accordance with the manufacturers instructions and that the situation in which the tail lift is installed does not compromise the safety of the operator.

The specifier should carry out a 'Risk Assessment' to ensure that an appropriate tail lift is selected for the specified application and that the tail lift is safe to operate when in use.

The user is required to ensure that the tail lift is maintained to the required standard, that the mandatory LOLER 'Thorough Inspections' take place and are acted upon, that operator training is provided and that maintenance, inspection and training records are kept.

Manufacturers, specifiers, installers and users who fail in their duty to provide employees with equipment that is safe to use leave themselves exposed to the prospect of litigation in the event of an accident.

Key Note

This guide is intended to assist the specifier and user in their choice of an appropriate tail lift to suit a given application and create an awareness of the potential hazards that may be encountered.

For the full and definitive regulations governing the manufacture and installation

of tail lifts, reference should be made to BS EN 1756-1:2001 which deals with tail lifts for goods and BS EN 1756-2:2004 covering tail lifts for passengers. Both of these documents are likely to require the assistance of an expert to fully understand the implications of the clauses detailed within the regulations.

References

BS EN 1756-1:2001 Tail lifts - Platform lifts for mounting on wheeled vehicles -Safety requirements - Part 1: Tail lifts for goods.

BS EN 1756-2:2004 Tail lifts - Platform lifts for mounting on wheeled vehicles -Safety requirements - Part 2: Tail lifts for passengers.

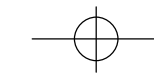
Supply of Machinery (Safety) Regulations 1992.

Management of Health & Safety at Work Regulations 1992.

Provision and Use of Work Equipment Regulations 1998.

Lifting Operators and Lift Equipment Regulations 1998.

Health and Safety at Work Act 1974.



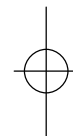
Sponsors

SOE IRTE thanks the following for their support in producing this guide



The Ray Smith Group Plc is a leading manufacturer and supplier of demountable body systems, all types of cantilever tail lifts and drawbar trailers.

The Ray Smith Group Plc would be pleased to provide technical assistance with the compilation of tail lift specifications to suit given applications, whilst ensuring compliance with the relevant regulations and standards applicable to tail lifts.



Product Care from The Ray Smith Group Plc



- Extended Warranty
- 24 hour, 365 days a year, 'freephone' Breakdown Service.
- Nationwide Agent Network.
- Contract Maintenance.
- LOLER Inspections.
- Training



The Society of Operations Engineers
22 Greencoat Place, London SW1P 1PR

Tel: 020 7630 1111 Website: www.soe.org.uk Email: soe@soe.org.uk

Registered Charity No. 1081753 Registered in England Company No: 3667147

