WISH

Waste Industry Safety and Health Forum

INFORMATION DOCUMENT

SAFE USE OF REFUSE COLLECTION BIN LIFTERS AND BINS

This WISH information document is aimed at health and safety improvements in the waste management industry. The Health and Safety Executive provided support to WISH in producing this guidance. This guidance may go further than the minimum you need to do to comply with the law with regard to health and safety

Contents

Introduction and scope

This information document is written for users, manufacturers and suppliers of refuse collection bin lifters and wheeled bins used for the collection of domestic and trade waste.

Wheeled refuse collection bins (both domestic ‘wheelie bins’ and larger sized trade waste bins) and vehicle mounted bin lifters have been in use in the UK since the mid1980s. Despite technological developments and collective experience with this equipment, significant numbers of serious accidents, including deaths, still occur.

The industry uses a wide range of bins and bin lifters and there are often incompatibilities of design and manufacture between:

- Bins
- Bin lifters, and
- The ways in which both are used

The guidance gives examples of risks of injury to workers and members of the public and indicates some protective measures and safe operating procedures that can be used to minimise these risks.

Risks of injury

The following are the most common serious accidents to waste collectors (loaders) involving bins and bin lifters:

- Struck by the bin, still attached to the bin lifter, as it returns to ground level
- Struck by a bin falling from the bin lifter
- Becoming entangled in the bin lifter during the tipping cycle
- Injured when releasing a waste bin ‘hung up’ on the bin lifter, or lost in the back of the hopper

Further information – examples via case studies of typical accidents can be found in WISH reference document REF 02 Case Studies bin lifters and bins on waste vehicles. All WISH documents this can be found on the WISH web site.

Risk assessment

A suitable and sufficient risk assessment should include all the significant risks relating to:

- Moving the waste bin
- Use of the bin lifter when loading onto and removing the waste bin from the bin lifter, including:
  - The effects of the size and weight of the bin and its contents
  - Flexing due to excess weight
  - Work organisation, eg the order in which bins are loaded onto the bin lifter
- Incompatibilities between the bin and the bin lifter
- Inadequate maintenance of the bins and bin lifters
- Other significant factors, eg human factors, such as:
  - Work organisation, eg who operates the bin lifter controls
  - Entering the lifting zone while tipping
  - Shaking the bin with the bin lifter, to release compacted waste
  - Climbing onto vehicles to release bins that have ‘hung up’ on the vehicle at the top of the tipping cycle
  - Not adhering to safe systems of work, for example loading unsafe (e.g. overloaded) bins and reaching into the lifting equipment

Managing the risk

Design and compatibility of equipment

Design of waste bins, bin lifters and vehicles

European standards provide guidance on compatibility of equipment for designers, manufacturers and suppliers of wheeled waste bins, bin lifters and vehicles. These include:

- BS EN 1501-1:2011+A1:2015 Refuse collection vehicles - General requirements and safety requirements - Part 1: Rear loaded refuse collection vehicles
- BS EN 840 Parts 1-6: 2012 Guidance on the design of waste bins
- BS EN 1501-5. Guidance on the integration of the refuse collection vehicle and lifting device (bin lifter), and the lifting device and designated waste bin.

New vehicles coming into use should have work area protection at the rear of the vehicle, including proximity sensing devices, to reduce the risks to workers from waste bins descending on the bin lifter. For older vehicles where such systems are not fitted, there is no requirement to retro-fit, however, users of the equipment should institute a suitable system of work to minimise the risk of collision between the worker and the equipment (see section on "Safe use of equipment" below).

Equipment compatibility: matching waste bin and bin lifter

When purchasing new and replacement equipment, users should ensure that the waste bins and bin lifters they choose are fully compatible with each other. This can be achieved, for example, by including specifications:

- In equipment purchasing policies, where the equipment is directly owned
- In service tenders and contracts where some or all of the waste collection service is provided by contractors

Where relevant standards are specified in tenders and contracts, then clients and contractors should ensure that the equipment provided for waste collection meets the requirements of those Standards.

There are a range of different designs of waste bins and bin lifters in service. Although compatible, they may require specific and precise adjustments to the lifting mechanism to ensure that the bin is held in place effectively during the tipping cycle. Special attention should be paid to the requirements for maintaining the condition of bins and bin lifters, to ensure that compatibility can be maintained in use (see section on "Maintenance" below.

Choosing bin lifters and bins

New bin lifters and bins should conform to the requirements of BS EN 1501-1: 2011 and BS EN 840 Parts 1-6: 2012.

The requirements of BS EN 1501-5 should also be considered when integrating new or existing vehicles, bin lifters and bins.

Generic requirements for waste collection equipment are given below, but reference should be made to the relevant Standards for more detailed information before choosing or modifying equipment.

Bin lifters

The bin lifter should be designed for designated waste bins and for the maximum possible load of the bins chosen (see BS EN 840: 2012). The safe working load (SWL) should be clearly displayed on the vehicle, close to the bin lifter.

Monitoring devices (ie devices that detect bin position in the bin lifter and measure the referenced height of the bin) should limit automatic or semiautomatic lifting to 400 mm, if the bin is not correctly located in the bin lifter.

Automatic or semiautomatic lifting should not be possible without interlocked barriers in place, to prevent workers entering the movement zone from the sides.

The peripheral speed of the bin lifter (outermost point when tipping) should not exceed 2.5 m/s for bins with a capacity of equal or less than 2500 l, and 1.5 m/s for bins with a capacity greater than 2500 l, when measured from a standard point less than 2500 mm from ground level.

Bin lifter/vehicle interface

Where bin lifters and hopper compactors can operate simultaneously, there should be some means of preventing a collision between the two.

Any crushing or shearing hazards should be eliminated by design of the bin lifter or, where there is any residual risk, by suitable guarding (see BS EN 349: 1993).

To prevent foot injuries, the distance between ground level and the normal lowest point of the lifter should be at least 120 mm. If the lifter needs to be lowered to ground level, a hold-to-run control should be provided in a position on the vehicle where the lifter is in full view.

Controls

Bin lifter operating controls should be:

- Mounted in a safe place outside the bin lifter and bin movement zone. Account should be taken of the additional hazards presented by split-backed vehicles
- Positioned to avoid operatives standing adjacent to passing traffic
- Protected against accidental operation and arranged so that the operation of the controls mimics the direction of bin lifter movement, (eg the upper button for ‘lift’ and the lower button for ‘lower’)

Switching from manual to automatic mode should only be possible with the bin lifter in the lowest position and should not initiate lifting. Automatic mode should be cancelled by switching to manual mode.

The bin lifter should stop when the manual hold-to-run control is released.

At least two clearly identifiable emergency stop devices should be provided which:

- Stop the bin lifter immediately when used
- Are accessible from either side of the vehicle
- Have a clear view of the bin lifting zone
- Have an acoustic signal, which sounds in the driver's cab when the emergency stop is activated
- Prevent automatic restart without manual resetting

Hydraulics

Bin lifters should have hose burst protection valves mounted directly on the lifting rams.

All hydraulic hoses and fittings should have a safety factor of at least twice the normal working pressure. Where hoses are located within 500 mm of the normal working area, workers should be shielded from the sudden failure of a hose, with protection that is sufficiently sturdy to stop or divert fluids away.

The hydraulic power system should comply with the requirements of BS EN ISO 4413:2010. Hydraulic fluid power. General rules and safety requirements for systems and their components.

Bins

Reference should be made to BS EN 840-6: 2012 Mobile waste bins Part 6: Safety and health requirements, when considering:

- Shape and positioning of handles
- Type and positioning of wheels
- Fitting of direction blocks (to assist steering of wheels)
- Type and positioning of brakes
- Type and positioning of lids

Manufacturers' and suppliers' instructions for correct choice, correct maintenance and safe use of bins should also be referred to.

Bins conforming to BS EN 840 Parts 1-6 should have a certificate issued within six months of the date of purchase by a known and approved test facility.

They should be designed and built so that, when filled with an appropriate load, they:

- Fit securely into a compatible bin lifter (BS EN 1501-1:2011)
- Can be locked into the bin lifter during the tipping cycle (BS EN 1501-5: 2011)

They should fit safely onto the bin lifter without having to be manually carried or lifted.

They should be designed and built to minimise the pushing and pulling forces required to move them (BS EN 840 5: 2012). They should make best use of shape, size, centre of gravity, low rolling resistance and likely positioning of load, when positioning wheels and handles.

Four and two-wheeled bins should have suitable handles that give workers a safe, two-handed grip when pushing, pulling and manoeuvring them. Sharp edges which could cause injury should be eliminated by design of the bin.

Equipment maintenance

Regular, routine, scheduled cleaning, lubrication, examination and maintenance schedules are important. Completed service and maintenance work records on bin lifters and bin stock currently in service, permits patterns of deterioration and its causes to be established. Routine maintenance regimes can improve safety and reduce business losses by:

- Identifying faults before catastrophic failure
- Permitting repairs before the equipment becomes unserviceable
- Identifying incompatibilities or misuse, and permitting remedial action to be taken, especially where:
  - There are problems with the interface between bin lifters and bins
  - The equipment is used in an inappropriate environment
  - There is abuse of equipment

Bin lifters

Planned servicing and maintenance schedules for refuse collection vehicles (whether owned, hired, leased or borrowed) should also include the bin lifter, following the instructions provided by the manufacturer or supplier.

Where faults affecting safe use of the bin lifter are identified, arrangements should be made for prompt reporting, logging and timely repair.

Written instructions should identify any work that should be referred to specialists in bin lifter maintenance.

The bin lifter (including any wire ropes or chains which form part of its mechanism) should also be regularly inspected and **thoroughly examined** by an independent person competent to carry out the statutory requirements under the Lifting Operations and Lifting Equipment Regulations 1998 (LOLER).

Bins

Safe lifting of bins relies upon effective engagement of the bin with the bin lifter and the structural integrity of the bin throughout the emptying cycle.

Routine planned inspection of bin stock (in service) should use the manufacturer or suppliers' instructions to identify bins which are likely to:

- Fail during the emptying cycle, (eg fall from the bin lifter due to flexing around the rim of the bin)
- 'Hang-up' during the emptying cycle (eg when damaged lids catch on the bin lifter/vehicle structure)

Arrangements should be made for prompt reporting and repair or replacement of bins that are identified as unacceptably worn or faulty.

Repairs and maintenance to bins should use parts and materials specified in the manufacturer's instructions (or equivalent) and in accordance with the original BS EN 840 Parts 1-6: 2012 specification.

Safe use of equipment

In addition to the engineering controls for the safe use of bin lifters and bins, safe systems of work should address any residual risk. They should include:

- Manual handling issues, including safe movement of waste bins (eg over problematic terrain including kerbs, steps, slopes, cobbles etc)
- Restrictions, for each type of bin used, on the:
  - Type of waste
  - Maximum weight
  - Amount of compaction
- Situations where the bin should not be presented for tipping, (eg unacceptable contents, overweight or overfull)
- Situations under which it is (or is not) appropriate to use manual, semiautomatic and automatic tipping modes
- Work sequences for placing bins onto bin lifters, for example:
  - Both bins taken off a dual-lift bin lifter before another bin is put on
  - Agreement on which worker takes responsibility for selecting manual, semiautomatic and automatic modes and operating the controls
  - Note: semi-automatic and automatic modes are more hazardous than manual mode and safe systems of work need to be designed to account for this
- Safe standing positions for workers during the tipping cycle including information on the risk zones eg:
  - The lifting arc of the bin lifter
  - Under the bin
  - When it is in the raised position etc
- Safe bin retrieval arrangements, including:
  - Bins ‘hung up’ on the top of the vehicle (eliminating the need to climb on the vehicle)
  - Bins fallen into the hopper
  - These arrangements may include, for example, provision of portable unhooking devices and specialist backup support arrangements for crew etc)

Disclaimer and WISH

This information document has been prepared by health and safety practitioners to assist health and safety improvements in the waste management industry. It is endorsed by the WISH (Waste Industry Safety and Health) Forum. This information document is not formal guidance and represents good practice, which typically goes beyond the strict requirements of health and safety law.

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The Waste Industry Safety and Health (WISH) Forum exists to communicate and consult with key stakeholders, including local and national government bodies, equipment manufacturers, trade associations, professional associations and trade unions. The aim of WISH is to identify, devise and promote activities to improve industry health and safety performance.

Useful links and further reading

To find the most up to date versions of these British Standards or to purchase then check the British Standards web site provided through the British Standards Institution

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WISH website: www.wishforum.org.uk

HSE waste and recycling webpages: www.hse.gov.uk/waste/index.htm

Waste and recycling vehicles in street collection, Waste04 HSE 2005.
www.hse.gov.uk/pubns/waste04.pdf

Safe transport in waste management and recycling facilities Waste09 HSE Books 2004
www.hse.gov.uk/pubns/waste09.pdf

BS EN 1501-1:2011+A1:2015 Refuse collection vehicles - General requirements and safety requirements - Part 1: Rear loaded refuse collection vehicles
http://shop.bsigroup.com/ProductDetail?pid=000000000030299767

BS EN 1501-2:2005+A1:2009. Refuse collection vehicles and associated lifting devices. General requirements and safety requirements Side loaded refuse collection vehicles
http://shop.bsigroup.com/ProductDetail/?pid=000000000030180870

BS EN 1501-3:2008. Refuse collection vehicles and their associated lifting devices. General requirements and safety requirements. Front loaded refuse collection vehicles
http://shop.bsigroup.com/ProductDetail/?pid=000000000030110035

BS EN 1501-4:2007. Refuse collection vehicles and their associated lifting devices. General requirements and safety requirements.
http://shop.bsigroup.com/ProductDetail/?pid=000000000030170921

BS EN 1501-5:2011 Refuse collection vehicles. General requirements and safety requirements. Lifting devices for refuse collection vehicles British Standards Institution
http://shop.bsigroup.com/ProductDetail/?pid=000000000030133247

BS EN 8401: 2004.Mobile waste containers. Containers with 2 wheels with a capacity up to 400 l for comb lifting devices, dimensions and design
http://shop.bsigroup.com/ProductDetail/?pid=000000000030281178

BS EN 840-2:2012. Mobile waste and recycling containers Containers with 4 wheels with a capacity up to 1 300 l with flat lid(s), for trunnion and/or comb lifting devices. Dimensions and design. http://shop.bsigroup.com/ProductDetail/?pid=000000000030232444

BS EN 840-3:2012. Mobile waste and recycling containers -Containers with 4 wheels with a capacity up to 1 300 l with dome lid(s), for trunnion and/or comb lifting devices. Dimensions and design British Standards Institution

http://shop.bsigroup.com/ProductDetail/?pid=000000000030232447
BS EN 840-4:2012. Mobile waste and recycling containers - Containers with 4 wheels with a capacity up to 1 700 l with flat lid(s), for wide trunnion or BG- and/or wide comb lifting devices. Dimensions and design British Standards Institution
http://shop.bsigroup.com/ProductDetail/?pid=000000000030232450
BS EN 840-5:2012. Mobile waste and recycling containers - Performance requirements and test methods British Standards Institution
http://shop.bsigroup.com/ProductDetail/?pid=000000000030232453
BS EN 840-6:2012. Mobile waste and recycling containers - Safety and health requirements British Standards Institution
http://shop.bsigroup.com/ProductDetail/?pid=000000000030232456
BS EN 349: 1993. Safety of machinery. Minimum gaps to avoid crushing of parts of the human body British Standards Institution ISBN 0 580 213943
http://shop.bsigroup.com/ProductDetail/?pid=000000000030173737
Lifting equipment at work: A brief guide Leaflet INDG 290(rev1) HSE Books 2013 ISBN 978 0 7176 6483 2 www.hse.gov.uk/pubns/indg290.htm
Lifting Operations and Lifting Equipment Regulations 1998 SI 1998/2307 The Stationery Office 1998 ISBN 978 0 11 079598 0
http://www.legislation.gov.uk/uksi/1998/2307/contents/made
Provision and Use of Work Equipment Regulations 1998 SI 1998/2306 The Stationery Office 1998 ISBN 978 0 11 079599 7 http://www.legislation.gov.uk/uksi/1998/2306/contents/made
Safe use of work equipment. Provision and Use of Work Equipment Regulations1998. Approved Code of Practice and guidance L22 (Fourth edition) HSE Books 2014 ISBN 978 0 7176 6619 5 http://www.hse.gov.uk/pubns/books/l22.htm
Safe use of lifting equipment. Lifting Operations and Lifting Equipment Regulations 1998. Approved Code of Practice and guidance L113 HSE Books1998 ISBN 978 0 7176 1628 2
http://www.hse.gov.uk/pUbns/books/l113.htm
Using work equipment safely Leaflet INDG229(rev2) HSE Books 2002 (single copy free or priced packs of 10 ISBN 978 0 7176 2389 1) Web version:
www.hse.gov.uk/pubns/indg229.pdf
Supplying new machinery: A short guide to the law and some information on what to do for anyone supplying machinery for use at work Leaflet INDG270(rev1) HSE Books 2011 (single copy free or priced packs of 15 ISBN 978 0 7176 1560 5) Web version:
www.hse.gov.uk/pubns/indg270.htm

Buying new machinery: A short guide to the law and some information on what to do for anyone buying new machinery for use at work Leaflet INDG271(rev1) HSE Books 2011 (single copy free or priced packs of 15 ISBN 978 0 7176 1559 9) Web version: www.hse.gov.uk/pubns/indg271.htm
Providing and using work equipment safely: A brief guide .Leaflet INDG291 HSE Books 2013 (single copy free or priced packs of 15 ISBN 978 0 7176 6477 1) Web version: http://www.hse.gov.uk/pubns/indg291.pdf
Safe use of lifting equipment. Lifting Operations and Lifting Equipment Regulations 1998. Approved Code of Practice and guidance L113 HSE Books 1998 ISBN 978 0 7176 6586 0 www.hse.gov.uk/pubns/books/l113.htm

- The Driver and Vehicle Standards Agency and the Department for Transport web pages can be found at www.gov.uk, where you can also find information about agency workers.
- The Freight Transport Association website: www.fta.co.uk
- British Standards can be obtained in PDF or hard copy formats from BSI: http://shop.bsigroup.com or by contacting BSI Customer Services for hard copies only Tel: 0845 086 9001 email: cservices@bsigroup.com