

## **SAFETY IN THE OPERATION OF AUTOMATIC BIN LIFTING EQUIPMENT ON RCVs**

*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*

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In March 2023 WISH issued a position statement on the safe use of RCV (refuse collection vehicle – bin lorry) bin-lift equipment in automatic mode. This sheet is based on the above statement, expanded to account for developments since its publication. It is anticipated this sheet will likely be revised and updated in the future to take account of further developments. This information sheet is primarily aimed at users of RCV bin-lifting equipment with automatic mode. Designers, manufacturers, and suppliers may also find the information useful.

**Note** – WISH has been asked numerous questions on the topics in this information sheet. To assist the sector, WISH has reproduced the most common questions asked and the answers to these as a FAQs sheet. This sheet is available as WISH REF 13 at: [WISH REF 13](#).

## Introduction

There is a history in GB waste and recycling of serious and fatal accidents associated with the operation of RCV bin-lifting equipment in automatic mode (see section below and WISH REF 02 'case studies: bin-lifters and bins on waste collection lorries' at [WISH REF 02](#)).

RCV bin-lifting equipment is covered by the formal standard BS EN 1501-5. Following representations from the Health and Safety Executive (HSE), the Office of Product Safety and Standards (OPSS) issued a restriction on the current version of BS EN 1501-5. This came into force on 30<sup>th</sup> November 2023. The reason for the restriction is that BS EN 1501-5 does not adequately address the prevention of reasonably foreseeable human error, defined as 'foreseeable misuse' to be consistent with the terminology used in the 'essential health and safety requirements' (EHSRs) of the Supply of Machinery (Safety) Regulations.

RCV bin-lifts when in automatic mode currently do not adequately differentiate between a person and a waste container/bin. Close approach of a person to automatic bin-lift activation sensor/s and/or personal contact with activation switch/es may inadvertently cause the lifting mechanism to operate leading to the risk of persons being injured by the mechanism and/or being thrown into the RCV's load hopper. This may occur during foreseeable tasks such as clearing spilt material or manually loading refuse. Members of the public may also be at risk if they attempt to throw material into the RCV hopper. While the OPSS restriction is intended to cover new machines placed on the UK market after its date of issue, many existing machines continue to have the same vulnerabilities.

Until appropriate physical safeguarding solutions have been developed for new machines and retrofitted to the GB fleet of RCVs currently in use, the procedural controls/approaches in this information sheet represent 'best practice' to assist in managing the hazards and minimise the risks to workers and others.

WISH would urge the waste and recycling industry and suppliers/manufacturers to work together to develop effective and practical physical safeguarding controls, and until such controls have been designed and installed to only use bin-lifts in automatic mode with the utmost care.

**Note.** *The OPSS restriction notice is available at [OPSS notice](#). In addition, the OPSS has also issued a safety report on one specific model of bin-lift, available at [OPSS safety report](#).*

## Background – accidents, hazards, and risks

Wheeled refuse collection bins (both domestic 'wheelie-bins' and larger size trade waste bins) have been emptied using bin-lifts since at least the 1990s. Lifting mechanisms can operate in manual, semi-automatic, and automatic modes. Despite technological developments and collective industry experience with this equipment serious accidents, including deaths, still occur with bin-lifts when used in automatic mode (see WISH REF 02 as noted above for examples), such as:

- Workers' clothing becoming entangled either directly in the lifting mechanism, or with the bin itself, resulting in them being lifted and tipped into the hopper, or injured in the lifting machinery itself
- During hand-loading of wastes into a RCV's hopper (such as manual loading of bagged waste or 'side waste') workers have accidentally activated the bin-lift and been thrown into the vehicle hopper or injured by the lifting machinery itself
- Workers have approached the RCV hopper to clear detritus, blocked wastes etc and have accidentally activated the bin-lift and been thrown into the vehicle hopper or injured by the lifting machinery itself
- Members of the public have also accidentally activated RCV bin-lifts and been thrown into the hopper or have become entangled in the lift mechanism. For example, a member of the public who has forgotten to 'put-their-bin-out' and dashes to the hopper to throw their waste in before the vehicle moves-off

These incidents result from the inadvertent activation of the bin-lift mechanism when in automatic mode. Injuries are caused either by the action of the bin-lift itself (or where multiple bin-lifts are fitted sometimes the action of an adjacent lift) and/or persons being lifted into the RCV's load hopper and coming into contact with the moving parts of the vehicle's compaction mechanism.

## Physical safeguards and interim physical solutions

'Procedural' controls, such as instructing and training workers, are covered in the section below. However, procedural controls are known not to be 100% effective – people do not always 'do the right thing'. Physical safeguards, such as guards, interlocks, sensing/detection systems etc, are usually more effective. At the time of writing of this information sheet such physical safeguards have yet to be fully developed and approved.

Until BS EN 1501-5 has been amended to address the issue of foreseeable misuse through safeguarding measures which can effectively differentiate between a person and waste container, or otherwise keep persons out of the 'danger zone', **new** machines will require competent third-party conformity assessment to confirm how a manufacturer has addressed the hazards associated with a person being present in the 'danger zone' during the lifting, tipping, and lowering of bins.

For **existing** machines, the HSE is working with the industry, manufacturers, and WISH to help develop solutions that can provide a combination of physical interlocking safeguards and/or sensing/detection systems which can be retrofitted to the current GB fleet of RCVs.

Whether from new or a retrofit, the aim is to prevent persons coming into contact with the moving dangerous parts of a machine, in this case bin-lifts and compaction mechanisms. This includes physical safeguarding measures to prevent a person being mistaken for a waste container/bin through accidental contact with a process sensor/s and/or switch/es that results in the inadvertent activation of automatic lifting. Any physical safeguarding measure/system fitted to achieve the above should be:

- Compliant with PL<sub>d</sub> (safety performance level 'd') of BS EN ISO 13849-1 'Safety of machinery, safety related parts of control systems, part 1 general principles for design'. Because of factors such as the likely severity and frequency of approach, any system fitted must be robust and reliable – meeting a safety performance level of 'd' in the design risk assessment is part of ensuring this. Note - it is accepted that for some older vehicles reaching a performance level of PL<sub>d</sub> may not be practicable. However, this should still be the aim. In addition, even with a retrofitted modification a substantial residual risk may still remain. In these cases, you should redeploy the vehicle on to a task where the bin lift does not need to be operated in automatic mode for its remaining life and disable the bin-lift automatic mode

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- Integrated safely into the RCV's control system, again to achieve an overall system performance level of  $PL_d$  in line with BS EN ISO 13849-1, and ensure that operation of the safety device/s shall as a minimum:
  - Disable the RCV's automatic compaction cycle from initiating, **and**
  - Stop any compaction cycle in progress, **and**
  - Stop any further movement of all lifting arms (including where fitted all multiple/split refuse container lifting arms)
- The integration of systems, including retrofitting, must be designed, and carried-out by a competent person/s to ensure that installation does not result in unintended consequences such as the deactivation or impairment of existing safety and control systems. For retrofitted systems this is very likely to require the input of the OEM (original equipment manufacturer)
- Any safeguarding system must 'fail to safe' and not to danger

Where users of existing vehicles are seeking to develop 'interim' safeguarding measures any such interim safeguarding should include:

- Communication with their suppliers to clarify what physical safeguarding measures are available, including physical risk mitigation devices
- Solutions involving 'person detection' in the danger zone may be considered. However, it is important that such devices are correctly integrated into RCV control systems so that they do not 'fail to danger'. If transceiver, RFT (radio frequency tagging), camera and/or AI recognition or similar systems are being contemplated it should be noted that these are not generally considered as a primary control measure
- That such interim solutions are intended to improve safety assurance until current manufacturer systems are fully developed and approved

## Procedural controls

Until appropriate physical safeguarding measures as outlined above can be put in place, users should consider their procedural controls in light of the information in this sheet.

### Risk assessment

You should assess how your workers operate RCVs. Your assessment should take into account the information in this document, along with WISH WASTE 04 ('waste and recycling vehicles in street collection', available at [WASTE 04](#)), WISH INFO 10 ('safe use of refuse collection bin-lifters and bins', available at [INFO 10](#)), and WISH REF02 ('case studies bin lifters and bins on collection lorries', available at [REF 02](#)), and the information provided by your bin-lift supplier/s.

### Training, information, instruction, and monitoring

You should have in place safe ways of working and ensure that workers are given appropriate instruction and training. This is particularly important for agency/temporary workers. Instruction and training should be repeated periodically. Specific issues to be addressed should include:

- That operating bin-lifts in automatic mode is more hazardous than manual mode, and how your safe ways of working eliminate and/or reduce these hazards
- Situations where a bin should not be presented for lifting and tipping, including damaged bins, overweight bins, and over full ("grinning" or "top hatting") bins
- Where automatic and manual modes should and should not be used, based on supplier's instructions and your assessment of risk. While it is not practical for every individual RCV bin collection to be risk assessed (see WISH WASTE 23 'safe waste and recycling services', available at [WASTE 23](#)), workers should have sufficient understanding of the general principles of each mode of operation of lifting equipment to allow individual crews to make appropriate judgements
- That automatic should **not** generally be the default mode used all day without appropriate risk assessment, training, safe ways of work and adequate supervision being in place to manage the resulting risks
- Where it is **not** appropriate to use automatic mode including:
  - Trade waste - that larger trade waste bins should **not** be emptied using automatic lifting mode
  - Spaced collection points – that automatic mode should **not** be used where collection points are well spaced, such as in some rural areas

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- Hand loading – that **only** manual lifting mode should be engaged when loading bagged, side waste or other hand-loaded wastes
- Clear working procedures for placing bins onto automatic bin lifters, including rules for which worker has responsibility for selecting manual or automatic modes
- The safe standing positions for workers during the lifting and tipping cycle
- What to do when bins ‘hang-up’, waste jams and blocks during lifting and tipping, clearing of debris/detritus from the lifting mechanism and/or hopper, or other similar problems, and your arrangements to ensure that the machinery cannot be inadvertently restarted during such tasks. These should be captured in your procedures and operator training
- Your control measures to ensure that workers and members of the public do not approach an open bin-lift (no bin in place) which is in automatic mode
- Your monitoring, instruction, and training arrangements to ensure effective compliance with your risk assessments, procedures, and training

## 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

WISH WASTE 04 Safe use of waste and recycling vehicles in street collection

WISH WASTE 23 Safe waste and recycling collection services

WISH INFO 10 Safe use of refuse collection vehicle bin lifters and bins

WISH INFO 11 Safety in driver only commercial collections

WISH REF 01 Example daily periodic check sheets for street collection vehicles

WISH REF 02 Case Studies bin lifters and bins on waste vehicles

WISH REF 03 Example refuse recycling collection round data sheet

WISH REF 04 Example format driver assessment

WISH REF 13 FAQs on safety in the operation of automatic bin lifting equipment on RCVs

All WISH publications are available from the WISH web site as free downloads.

Waste Industry Safety and Health (WISH) Forum can be found at <https://wishforum.org.uk/>

HSE's waste website: [www.hse.gov.uk/waste](http://www.hse.gov.uk/waste)