



**APPLICATION OBJECTIVE**

To pick up all kinds of household waste provided in waste containers or other receptacles under a pick-up arrangement.

**WASTE TYPES**

Mixed household waste	Biowaste
Paper/paperboard	Bulky waste incl. Electronic & household appliances
Glass	Other waste materials (*)
Light-weight packaging	

*(\*) All kinds of solid waste that arise continuously within a larger area and require a frequent pickup*

**SPECIAL CHARACTERISTICS AND REQUIREMENTS OF THE APPLICATION**

**POTENTIAL HEALTH RISKS:**

Loader: pickup procedures carried out on both sides of a street at once require the loader to cross traffic lanes frequently. If at all, such procedures should only be applied in areas with little traffic.

Driver: Arrangements which require the driver to help as a loader during the emptying of waste containers may increase the risk of personal accidents for the driver due to the fact that he must leave and re-enter the driving cabin many times. Barrier-free driving cabins which can be opened to the kerbside help to reduce this risk. Vehicle crews shall be required to wear tight footgear and other protective clothing, including mouth masks if necessary.

**OPTIONS FOR THE UTILISATION OF THE OUTPUT:**

The compaction of the waste in the truck body results in a mixture and caking of the waste. This makes a separation afterwards difficult.

**OTHER ASPECTS:**

Collection vehicles can be additionally equipped with onboard computers to keep record on the emptying and other relevant data (e.g. weight of the bin) for purposes of service monitoring, tour planning and billing. Meanwhile the combination with bin identification technology is a common solution.

**RESTRICTIONS OR INFLUENCE OF EXTERNALITIES ON THE APPLICATION**

**INFRASTRUCTURAL CONDITIONS:**

To allow an efficient waste collection with this type of vehicle, waste collection containers shall be placed at locations easily accessible for the vehicle and the crew of loaders. The setting up of joint container sites for larger numbers of containers at suitable places and no-parking arrangements at the date of pickup can be very supporting in this respect.

**CLIMATIC CONDITIONS:**

No limitations except for the fact that the vehicle itself must be fit for the road conditions in the collection area.



TECHNICAL DETAILS

GENERAL OVERVIEW

Abstract

The rear-end refuse collection vehicle is the most widely spread standard vehicle for the pickup and short distance transportation of various waste types. For that reason a vast number of constructional modifications are in practical use. The receptacles with the waste are emptied either manually or by means of a lifting device into the vehicle body. The usual configuration is a tail lifting device for the emptying of different types of mobile waste containers integrated into the vehicle body is a compaction mechanism.

The compaction is either done by the linear movement of a packer plate or through the rotation of a screw-type rotating drum. Upon arrival of the vehicle at the waste treatment facility, the rear-end compartment of the vehicle body is opened and the waste discharged.

Basic requirements

- In case of a collection in waste containers a comb or diamond lifting device for emptying

Specific advantages

- High loading capacity through on-board compaction of the waste
- Can be used flexibly for various types of waste
- Can be used for both pickup and short-distance transport at the same time
- Comparatively small dimension and low unladen weight of rear-end loaded vehicles with a screw-type compaction or compaction by rotating drum

Specific disadvantages

- Relatively high priced vehicle
- Minimum of 2 labour force needed
- Not suitable for longer waste storage
- Use of vehicles with compaction by a screw-type rotating drum limited to residual and biowaste collection to a large degree

APPLICATION DETAILS

Technical scheme

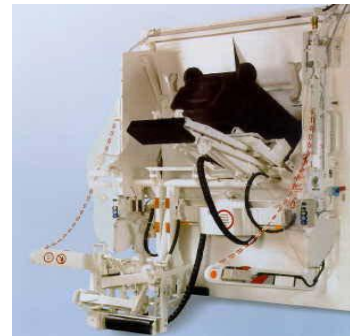
During operation the waste is being thrown manually (sack) into the feed hopper or loaded from the waste containers by means of the lifting device on the rear end of the vehicle. The compaction mechanism compresses the waste and forwards it from the feed hopper into the storage body of the vehicle. Once the body is completely filled up, the vehicle goes to the disposal facility where it opens its rear to discharge the waste.

Compaction mechanism and lifting device can be operated manually, semi-automated and fully automated.

Economically most relevant are the allowed loading volume and carrying weight as those parameters determining the number of discharge topps.



Pic. a: basic version of the rear-end loaded vehicle



Pic. b: dual comb lifting device



Pic. c: double body vehicle for the parallel collection of two of source-separated waste fractions. (with one feed hopper opened for discharge)



Pic. d: Emptying of a rear-end loaded vehicle with the help of the ejection plate



Pic. e: Vehicle with screw-type rotating drum and low-entry cabin 'Econic'



Pic. f: Special version of rear-end loaded vehicle with swap body (with feed hopper and lifting device turned down for container unload)

Further constructional elements of this type of vehicle are:  
Two or three axles with one self-turning front or trailing axle for better turning circle, pneumatic or steels springs, platforms(s) for outboard rider(s).



<b>Quantity aspects</b>	The carrying capacity is limited by the allowed total load of the vehicle and the body type (permitted load)
<b>Scale of application</b>	Loading volume and loading mass of the different vehicles: in the range of 5-27 m <sup>3</sup> , and 6-12 Tons.
<b>Inter-operability</b>	The vehicle can be used for the pickup of waste and short distance transportation under different collection schemes. The construction of the litter device is compatible to waste bins with comb or diamond-adapted fringe. Other moveable bin types of low weight and sacks can be emptied as well. Also a direct feeding of waste (bulky items) into the feed hopper is possible.

**OPERATIONAL BENCHMARKS**

<b>Human resources needed</b>	<b>Human resources needed</b> <ul style="list-style-type: none"><li>▪ One truck driver and up to two loaders.</li></ul>
<b>Investment/ Operating costs</b>	<b>Investment costs</b> <p>The capital needs (investment) for rear-end loaded refuse collection vehicles are as follows:</p> <ul style="list-style-type: none"><li>▪ 1 truck (3 axes, 20 Mg carrying capacity): 60,000-80,000 Euro</li><li>▪ Body: 30,000-40,000 Euro</li><li>▪ Lifting device: 10,000-20,000 Euro</li><li>▪ Price for additional items:<ul style="list-style-type: none"><li>• Low entry cabin: 10,000 Euro</li><li>• Vehicle superstructure for exchangeable body: 20,000 Euro</li><li>• Swap Body: 3,000-5,000 Euro</li></ul></li></ul> <b>Operating costs</b> <p>Running costs accrue for:</p> <ul style="list-style-type: none"><li>▪ Repair and maintenance: ~11% of the initial investment per annum</li><li>▪ Personnel: 2-6 persons (most common is a crew of 2-3 staff depending on the mode of operation)</li></ul>

**OTHER RELEVANT ASPECTS**

<b>Labour protection</b>	For the use of this technology tight labour protection regulations need to be observed in Europe. For example: <ul style="list-style-type: none"><li>• Technical rules for bio-waste collection, protective measures</li><li>• Regulations for safety and health protection during waste management activities</li></ul>
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