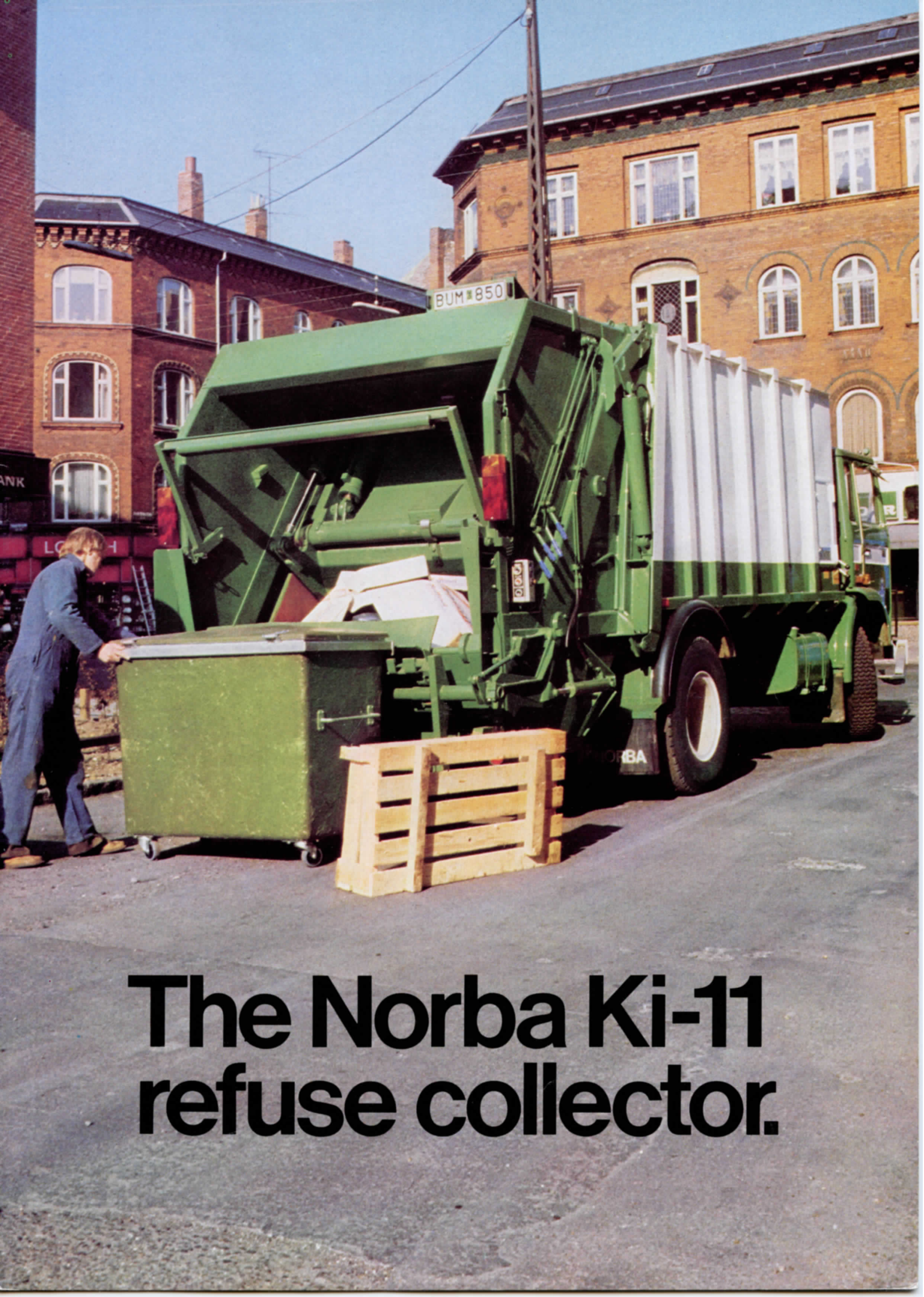


The Norba Ki-11 refuse collector.

Reliability is the outstanding feature of the Ki-11.

The most important aim when developing the Norba Ki-11 refuse collector was to ensure simple, reliable operation. No compromises were to be made regarding operational reliability and economy.

This basic aim has determined both the overall and the detail design of the Ki-11.

You can see this in the quality of the materials, such as the extremely strong, wear-resistant steel that is used for the hopper and the packer plate.

You see it in the detail design.

Have a look at the welds, for example, such as the ones between the channels and the side walls of the body. One of the benefits of these continuous seams is the elimination of rust. (The high quality of the welds is achieved by means of three automatic welding machines that we have recently installed.)

Or have a close look at the hydraulic rams, which are machined by three numerically controlled lathes.

And you can see how simplicity and reliability is reflected in our choice of components, such as those in the electrical and hydraulic systems. (We've installed a special test rig in which all rams are checked and tested under pressure.)

And you can see how our aims have been achieved in the hydraulic system, which includes three types of filters that combine to clean hydraulic oil effectively, to eliminate downtime and to ensure a long service life for the entire system.

All hydraulic pipe-ends are flared, which ensures a perfect seal even at high pressures and eliminates the need for retightening.

The Ki-11 is designed for reliable, economical operation.

The Ki-11 is designed to handle household and commercial refuse as well as light industrial waste. It can be loaded manually or by means of lifts for sacks, bins and containers (of up to 8 m³).

The Ki-11 is available with seven different body sizes, between 12 and 21 m³ (air space).

The refuse body can be mounted on many different types of chassis (see separate specification).

Our efforts to maximize the reliability of the Ki-11 are exemplified by the double control system, which allows the operator to select either automatic operation or manual override control.

Sack lift with folding platform.

Paladin container lift.

Lift for rectangular bins up to 800 l volume.

Lift for containers up to 8 m³ with agitator.

The Ki-11 combines safety and versatility.

An important parameter for design work on the Ki-11 has involved providing personnel with a safe working environment.

The safety systems of the Ki-11 meet the rigorous requirements of the National Swedish Board of Industrial Safety.

Control is simple and reliable. In semi-automatic mode, the operator uses push-button controls. The carriage and packer plates are then controlled by an electro pneumatic valve.

The electro pneumatic operation of the working cycle gives a smooth operation and an extremely low noise level.

In manual mode, control is effected by means of levers. The automated system is not actuated until the packer plate has moved past the rave bar of the hopper. During the entire compression phase, the packer plate and the hopper form a completely enclosed, protective wall.

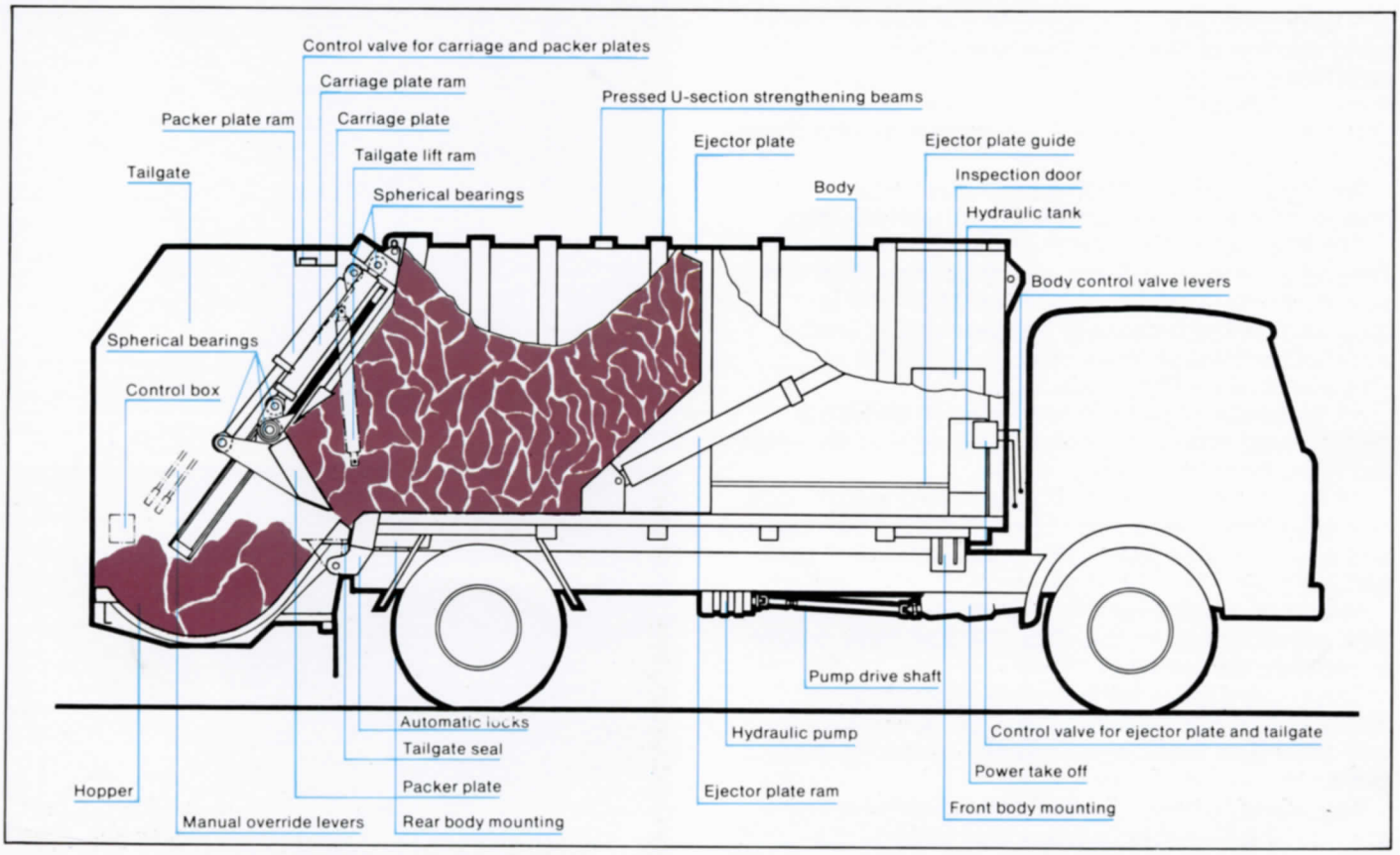
The high, straight rear frame of the tailgate facilitates installation of optional lifts and provides effective protection when a container is being emptied.

The conveniently located safety controls include an emergency stop which instantaneously arrests the movement of the packing mechanism.

The hydraulic rams for the tailgate are fitted with safety valves that prevent the tailgate from moving in the event of a pressure drop in the hydraulic system.

Other important features for the working environment include a working light on the tailgate as well as the convenient loading height of the hopper, which has been reduced as much as possible (min. 800 mm) in order to facilitate manual loading.

Let's have a closer look at the components.



We'll start with the body.

The body for the Ki-11 is available in seven different sizes and is resiliently mounted on the chassis. It is reinforced with channels that are seam-welded at all points of contact with steel plate. The continuous seam welds between the channels and the plate prevent rust.

The hydraulic pack is easily accessible through an inspection door on the right-hand side of the body.

Ejector plate.

The face of the ejector plate is smooth, which ensures complete discharge and eliminates the risk of waste adhering to the plate.

The ejector plate is fitted with durable Nylonite slipper pads which minimize friction. These pads can easily be replaced without removing the plate.

The hydraulic system includes a back-pressure valve that controls the movement of the ejector plate as waste is packed against it, thus increasing the payload.

Hydraulic system.

The hydraulic tank is mounted in the forward right-hand section of the body and is well protected. The tank has a capacity of 110 litres and is built in sections, for efficient cooling of hydraulic oil. The cover of the tank can be removed for inspection and cleaning.

The tank is fitted with three different filters to ensure oil cleanliness and increase system life.

The filter system consists of a 10-micron tank venting air filter, a 125-micron oil suction filter and a 10-micron high pressure oil filter. The latter is mounted on the outside of the tank and is easily accessible through the inspection door for replacement of cartridge, etc.

All hydraulic pipe ends are flared to ensure a reliable seal even at high pressures and to eliminate the need for re-tightening.

All hydraulic rams have hard-cromed piston rods and adjustable seals and the rams for the carriage and packer plates have spherical bearings at each end.

The control valve for the ejector plate and the tailgate are mounted on the side of the oil tank, easily accessible for service.

The control valve for the carriage and packer plates is mounted in the upper part of the tailgate well protected and easy accessible through a cover plate.

The carriage plate, packer plate and the tailgate operate at a hydraulic pressure of 18 MPa (180 bar). The ejector plate operates at a pressure of 9 MPa (90 bar). Optional lifting equipment operates at pressures of up to 10 MPa (100 bar).

The ejector plate and the tailgate are controlled manually by means of a valve on the right-hand side of the vehicle. An optional electro pneumatic system allows for remote control of the discharge cycle from any point e.g. the cab. The hydraulic system is designed for easy installation of optional lifts.

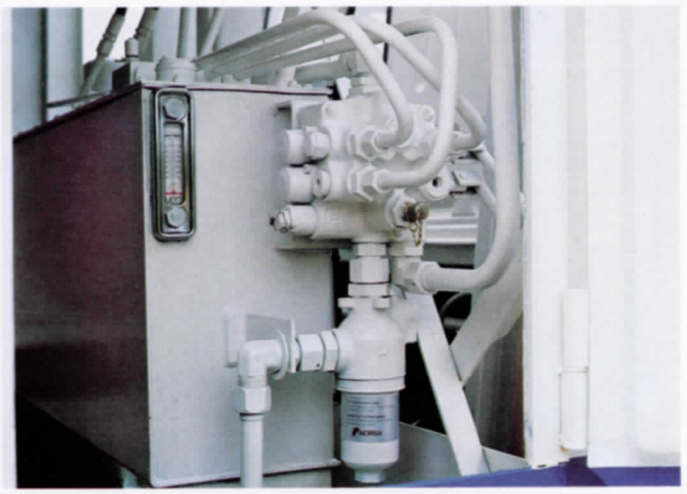
Electrical system.

The electrical system runs on 12 or 24 volts. It is simple, robust and reliable and is based on well-proven components. All cables are fitted in conduits and are mounted inside the beams for added protection.

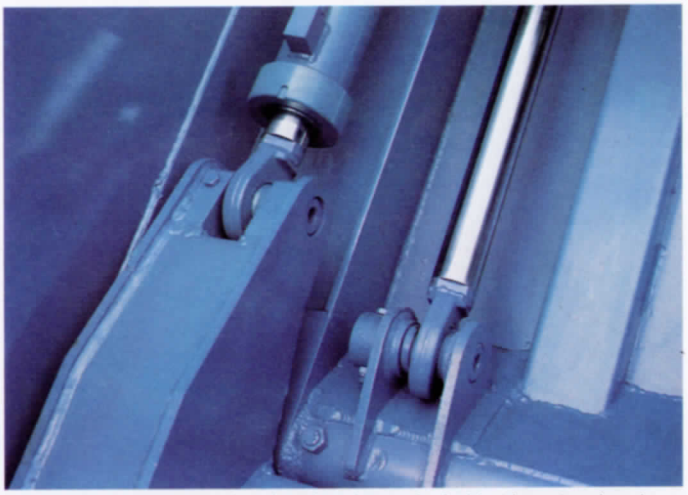
The control box is fitted on the right-hand side of the tailgate. Controls include push-buttons for start, stop and other functions. The box is insulated against humidity and has a built-in circuit light which radiates heat.

The loading cycle is controlled by push buttons, limit position switches and pressure switches.

The limit position switches activating the packing mechanism are fully built in and therefore well protected. They are easily accessible for service through a hatch cover.

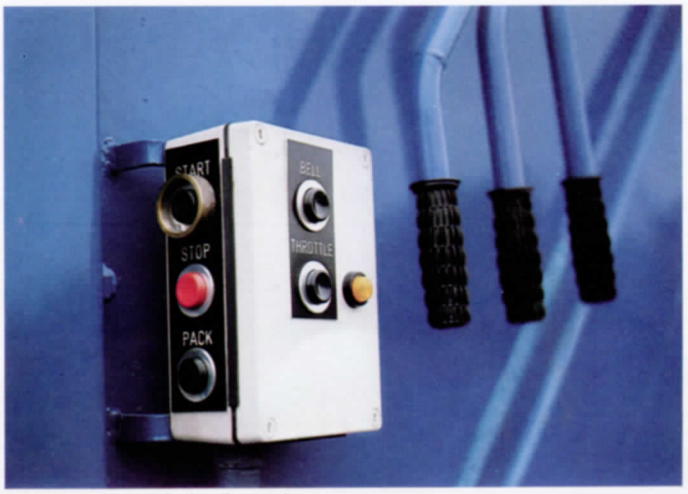


The hydraulic pack in the forward right-hand section of the body is easily accessible for service.



The rams for the carriage and packer plates have spherical bearings at each end.

Control levers for ejector plate and tailgate as well as throttle.



Controls and levers for loading cycle.

Tailgate.

The tailgate locks automatically against the body. The hydraulic pack is effectively protected from damage and is easily accessible for service.

The rams which elevate the tailgate are fitted with safety valves which prevent the tailgate from closing in the event of a pressure drop in the hydraulic system.

A hydraulically operated agitator for containers can easily be fitted. The agitator locks the container in emptying position and is thus a vital contribution to increased safety.

The tailgate is also fitted with a working light. Equipment for emptying containers can easily be fitted on the rear frame of the tailgate.

Hopper.

The fixed hopper is made of heavy-duty plate, with longitudinal channels. The bottom and sides of the hopper as well as the rear cross-member are made of high-strength, durable steel to withstand extreme stresses.

Carriage plate.

The carriage plate runs in guides that are fitted with hardened, high-strength steel.

The blocks on which the carriage plate runs are also made of hardened, high-strength steel.

These blocks can easily be replaced without removing the plate.

All bolts for blocks and rams are hard-chromed and have threaded holes to facilitate assembly and removal.

The carriage plate has a smooth face to prevent waste adhering.

Packer plate.

The heavy-duty packer plate is fitted with sturdy mountings for the rams.

The packer plate is spherically anchored to the carriage plate in order to compensate for uneven loads on the packer plate.

The wear surfaces of the packer plate, like those of the hopper, consists of high-strength, wear-resistant steel.

Throughout the compression phase the packer plate and the hopper form a completely enclosed, protective wall.

The wear surfaces of the packer plate, like those of the hopper, consists of high-strength, wear-resistant steel

The automatic locking mechanism secures the tailgate against the body

The limit position switches are well protected

High waste compression.

The packer plate compresses the waste in the hopper against the ejector plate within the body.

Efficient compression is achieved as the ejector plate moves gradually into the body under back-pressure, which is controlled by a hydraulic valve. The result is an improved effective load capacity.

The movement of the packer plate can be varied, so that even bulky waste can be loaded in the body. If required, the packer plate can operate continuously, e.g. for emptying of containers.

The entire load can be discharged in 60 seconds.

Discharging is controlled manually by a valve on the right-hand side of the vehicle. An optional electro pneumatic system allows for remote control of the discharge cycle from any point, such as in the cab or behind the vehicle.

The tailgate opens hydraulically, after which the load is discharged quickly and efficiently, without the risk of waste adhering to the ejector plate. The entire load can be discharged in about one minute.

Technical data for the Norba Ki-11.

Body

Capacity (air space): 12.0 13.5 15.0 15.5 17.0 19.5 21.0 m^3
Length: 3350 3575 3975 4150 4600 5225 5650 mm
Overall length incl. tailgate: 5060 5285 5685 5860 6310 6935 7360 mm
Width: 2430 mm
Height above chassis frame: 2050 mm
Total weight, assembled: 4850 4900 5000 5050 5320 5500 5600 kgs
Material, sides: 2.5 mm steel plate
Material, top: 2.5 mm steel plate, 4 mm at rear
Material, bottom: 4 mm steel plate
Strengthening beams, side: 3 mm U-profiles, vertical
Strengthening beams, top: 5 mm U-profiles
Strenghtening beams, bottom: 5 mm L-profiles

Tailgate

Working cycle: Approx. 24 seconds. Max. time required for electro pneumatic operation of controls, approx. 10 seconds.
Compaction force: Approx. 10,500 kgs at outer edge of packer plate.
Approx. 19,000 kgs in centre of packer plate.
Hopper: Standard hopper volume 1,330 dm^3.
Optional hopper volume 1,600 dm^3.
Width, inside 2,030 mm.
Material, sides and bottom 6 mm high-strength wear-resistant steel.
Loading height, min. 800 mm, see separate specification.

Hydraulic system

Pumps: See separate specification. Flow, approx. 1 l/s (60 l/min)
Valves: Ejector plate and tailgate manual or electro pneumatic. Carriage and packer plates electro pneumatic or manual.
Pipes: Flared ends, no retightening required.
Hydraulic pressure: Packer plate and tailgate: 18 MPa (180 bar).
Carriage plate: 8–18 MPa (80–180 bar).
Ejector plate: 9 MPa (90 bar).
Hydraulic tank volume: 110 dm^3 (110 liters).
Hydraulic system oil volume: Approx. 140 dm^3 (140 liters) for a 15 m^3 refuse collector body. Larger bodies require a somewhat higher oil volume.
Filters: 10-micron air filter, 125-micron oil suction filter, 10-micron high pressure oil filter.

Hydraulic rams

Ejector plate: Diameter 150/130/100 mm, stroke 2,547–3,675 mm depending on body size, double-acting, telescopic.
Packer plate: Diameter 90/60 mm, stroke 530 mm, double-acting, spherical bearings.
Carriage plate: Diameter 110/60 mm, stroke 800 mm, double-acting, spherical bearings.
Tailgate: Diameter 75 mm, stroke 700 mm, single-acting.

Electrical system

Voltage: 12 or 24 V.
Fuse: Single fuse in chassis electrical system.
Push-buttons, limit position switches and pressure switches for control of loading cycle.

Standard equipment

Hydraulic pump, see separate specification. Automatic locks for tailgate and body. Working light for tailgate. Vehicle lighting.

Optional equipment

Optional lifts. Hydraulic agitator for containers. Loading platform. Bin-cleaning system. Remote control for discharging. Electronic rear-view mirror. Vertical exhaust pipe. Sack rack. Reversing lights. Holders for bin- and sack trolleys, paper sacks, shovel and brush. Wheel blocks. Spare wheel carrier. Lockable toolbox.

For additional data on optional lifts, refuse collection bodies and chassis as well as power take-offs and oil pumps, see separate specifications.

The manufacturer reserves the right to modify design and equipment without previous notice.

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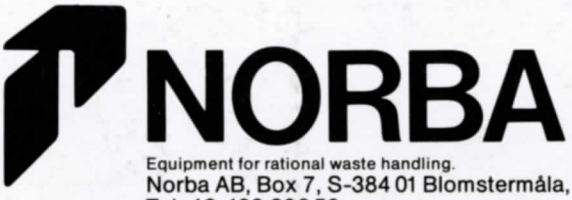

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