CONTCHAMP GENERATION F
THE MOST INNOVATIVE REACHSTACKER EVER BUILT


Kalmar
Kalmar

How will the DRF reachstacker from Kalmar affect your business?

An evolution based on many years of hard work and experience. Kalmar was the first to commercialise the reachstacker wordwide in 1985.

Our idea of handling containers more flexibly and with higher stacking and storage capacity became a success. The previous generation of reachstackers – DRD – was introduced in 1996 and has with more than 900 units in operation gained a reputation for reliability all over the world.

The introduction of the DRF in sept. 2002 has been the result of experience combined with state of the art technology. It is already a success all over the world because the generation F is built to fulfil the demands that small, medium-sized and multi-purpose terminals place on availability, reliability and operational economy.

Or as Christer Granskog, CEO of Kalmar Industries, puts it:

”We recognise your reality. We share it round the clock, all year round in more than 160 countries. It's all about reliable and efficient handling for high productivity. That's also what the new Generation F is about.”

Tested in the toughest of environments

In the environment where reachstackers work, there's simply no room for anything but perfection.

When the first series-produced Generation F reachstacker left the factory, it was therefore after more than a year of intensive testing – not just factory tests, but prototype trials with customers in real situations. One of the tests has been carried out in Europoort – P&O North Sea Ferries' terminal in Rotterdam.

"Almost maintenance free"

Joop Schoonmade is Europoort's senior technical superintendent shore.

"We bought our first reachstacker back in 1991 and it's still running. We now have a total of 16 reachstackers at our various terminals – all from Kalmar."

Joop and his colleagues have been testing a Generation F prototype for over half a year before the launch. The truck has been used in day-to-day operation, simultaneously with reports, tests, adjustments and tuning in co-operation with the test team from Kalmar.

"There have been very few problems. It's driver-friendly, smooth, powerful and a lot quicker to work with. It's also almost maintenance free. Thanks to all the innovations on the new reachstacker it's possible to extend the service intervals. That's a great step forward."

No previous Kalmar machine has ever been put through as many and as comprehensive tests as Generation F:

- **One prototype has been in test operation at various terminals.**
- **Another prototype has been test driven at the Kalmar Lidhult plant for over a year.**
- **The first series-produced reachstacker has been on trial in Hong Kong.**
- **One major test has been carried out in Europoort – P&O North Sea Ferries' terminal in Rotterdam.**

Driver Nico Goudappel, Jan Groenendijk (service engineer) and Joop Schoonmade (senior technical superintendent shore) have been testing a Generation F prototype for over six months.

Every year, P&O North Sea Ferries handles some 610,000 containers and trailers for traffic between the Continent and UK. The company has 16 reachstackers in total – all from Kalmar.

We have increased the service interval

Service is an important part of the overall operating economy.

With small and large improvements in many different areas, we have managed to increase the service interval to one of the best on the market.

Fewer lubrication points

There are now considerably fewer lubrication points. The boom and most bearings are lubrication-free. Separate hydraulic and brake systems, return filters as standard and higher oil quality all increase the life span of the oils. And when handling oils, you avoid having to use the additive Lubrizol.

Simpler inspection and servicing

On the Generation F, practically all the service and inspection points are on one side of the machine – easily accessible and clearly visible.

The Generation F also comes with educationally structured documentation (in accordance with international standards) adapted for your personnel.

Reliability built in

Another important aspect for overall economy is reliability. Vulnerable parts boast a quality level and a technical margin dimensioned for really tough working conditions.

All the axles for example have been chemically nickel-plated to prevent rusting-up. This may be a slightly more costly solution, but it is better for the overall economy in the long run. Reliability is built into every component and every fine detail.

Greater precision in diagnostics

The power and monitoring system allows far greater precision in fault location. Ordinary systems only reveal which part of the truck has a problem – not the exact component. The driver or service personnel can quickly identify the fault on the steering wheel display. Diagnoses can even be made via mobile phone or PC.

There are many opportunities for calibration, but they are also clearance controlled for optimum security. Settings and preferences can be adjusted, although only within permitted limits. All to minimise the risk of error.

Return filters for the hydraulic oil come as standard, maintaining cleaner oil and reducing wear on hydraulic components. One of many details that help assure longer service intervals.

The driver or service personnel obtain a rapid diagnosis on the display, eliminating the need for time-consuming fault finding via measurements from one connection point to the next.

Practically all the service points are easily accessible on one side of the machine. The drive line is easily accessible thanks to large inspection hatches.

The smartest system of all

New electrical technology increases operational reliability, improves the driving characteristics, and makes trouble shooting easier.

Most models on the market still use vulnerable technology – control with all kinds of different relays, contact points and extensive cablage. On the Generation F, this has been replaced by a distributed power system with data buses.

A few wires rather than thick cables

Important signals, such as 'lift', used to have to go through eight different connection blocks in three different chains of cables before reaching the cab. In a distributed power system, the nearest computer (node) picks up the signal at the actual command point, such as on the boom-point. All signals then pass through just a few wires in something called a CAN-bus.

The world's safest standard

CAN-bus is a communication standard, a looped network, the advantage being that it is easier to connect different modules – comparable in many ways to plug-and-play. Engine, transmitter, gearbox , valves etc. – all can basically be connected by simply plugging them in.

Generation F also utilises what is known as a redundant CAN-bus. This means that the system seeks out one node after the other and back again in a loop, feeding from two directions. Therefore, a part can be taken out of the loop and the system still retains its function, as the signals simply take an alternative route.

Faster, more precise information

A redundant system also means that any interruptions or faults do not lead to a non-operational truck. The driver is informed of the fault instantaneously, but can still carry on driving.

The monitoring system controls around 500 measuring points, 50 times a second. In the event of a problem, the driver is informed of this via the display.

Moreover, the information is more precise and technical personnel can therefore quickly decide what needs to be remedied.

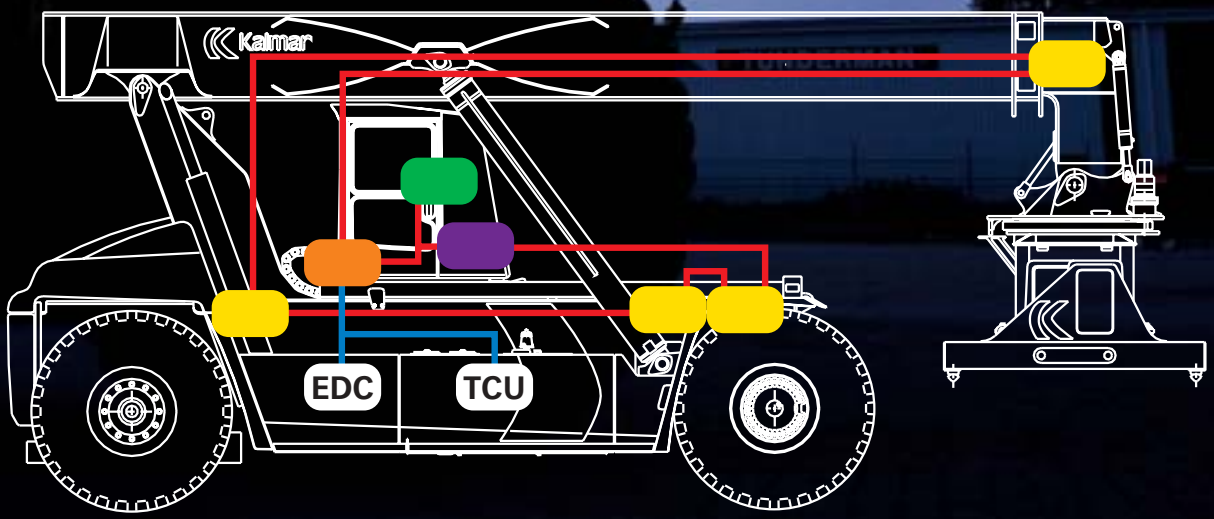
If for example a twist lock is not properly connected, the driver is instantly informed which of the four is causing the problem. He can then quick and easy adjust the unit and carry on lifting.

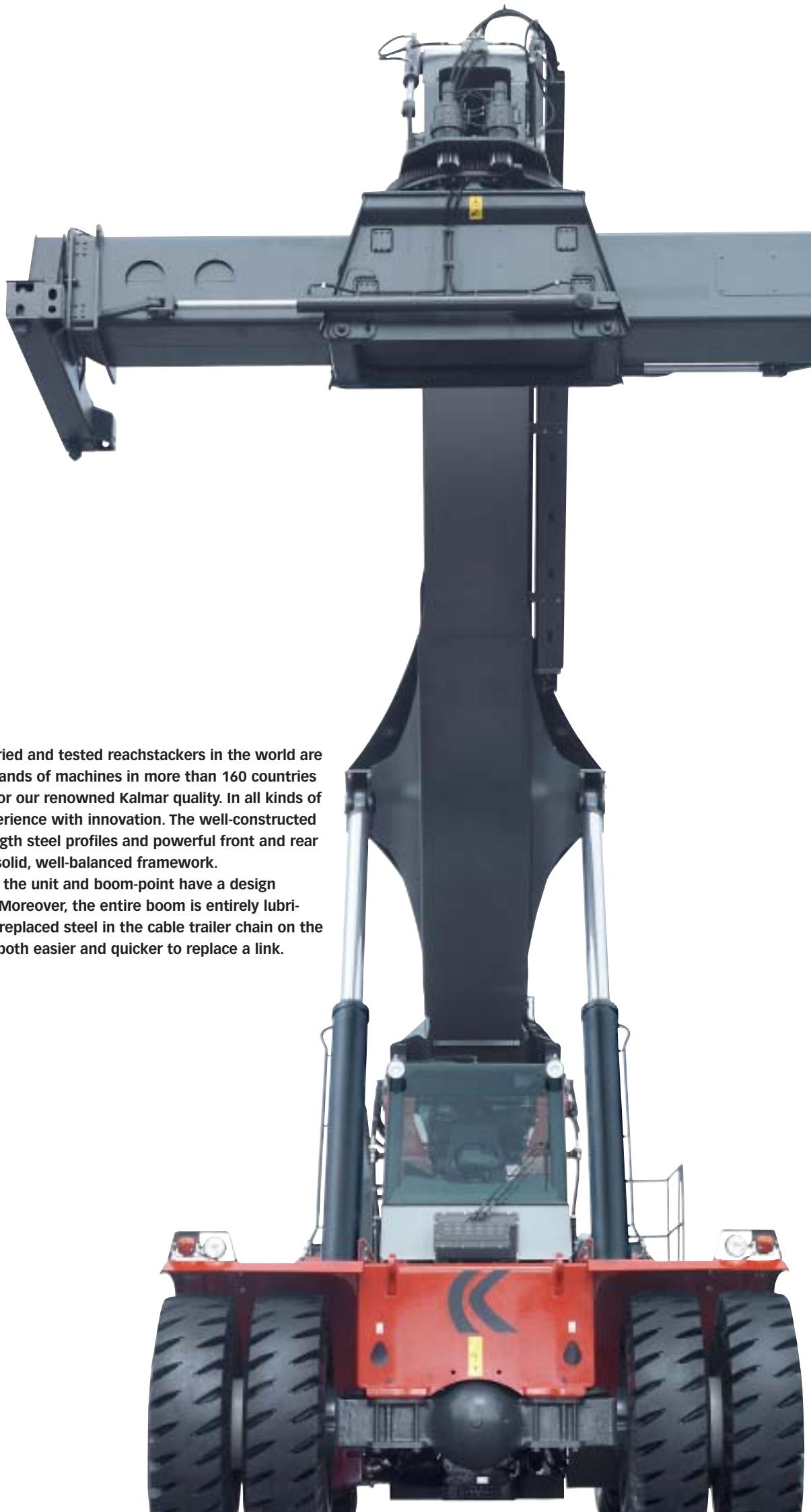
The CAN-bus standard reduces the occurrence of error sources. The system uses just a few wires, unlike the old solution with its extensive cablage and excess of relays and contact points. The fact that the system is redundant on the Generation F makes it practically 'fool-proof'. The high operational reliability is partly confirmed by the fact that the system is used in our Rough Terrain reachstackers for the US Army.

- = Cab unit – the heart of the communication.
- = Control units for different parts of the machine.
- = Information terminal with warning and indication lamps, functions keyboard.
- = Information Display that shows information from the system's units.

TCU = Transmission Control Unit. Deals with the gearbox.

EDC = Electronic Diesel Control. Controls fuel injection. All the engine sensors are also connected to EDC.





The most extensively tried and tested reachstackers in the world are made by Kalmar. Thousands of machines in more than 160 countries have made us known for our renowned Kalmar quality. In all kinds of areas we combine experience with innovation. The well-constructed chassis with high-strength steel profiles and powerful front and rear cross-heads provide a solid, well-balanced framework.

On the Generation F the unit and boom-point have a design for very high strength. Moreover, the entire boom is entirely lubrication-free. Plastic has replaced steel in the cable trailer chain on the boom, which makes it both easier and quicker to replace a link.

Demands from the US Army have set a new standard

When the US Army placed a requirement type contract with Kalmar RT Center LLC for around 400 units of Rough Terrain reachstackers, it gave us a unique opportunity to develop new technology and fundamentally review solutions and component selection.

The results included the world's first lubrication-free booms.

The hydraulic system

The hydraulic system is about balance, about getting many different components to work together. On the Generation F the results are immediately evident, as the precision is unbeatable.

Loading and unloading are noticeably faster and easier.

Separate systems for brake oil and hydraulic oil

Both the oil and the cooling systems are separated, which means that brake oil does not mix with the cleaner hydraulic oil. Separate systems also mean less heat, which assures a longer life for the oil and components alike.

A return filter for the hydraulic oil comes as standard. A separate gear pump provides continuous cooling and filtering – even when the truck is idling.

Fewer units, fewer hoses, fewer couplings

Previously separate units are built together in blocks. The DRF manoeuvring valve, for example, replaces the old two-unit solution, the servo is built into the main valve, etc. Furthermore, there are fewer couplings and hoses.

This makes for several advantages: safer systems, fewer potential leaks, simpler servicing and fault finding.

The details make the whole

ORFS couplings are standard. Thanks to their o-rings, they absorb vibrations considerably better than conventional metal-to-metal connectors.

Previously separate units are built together in fewer blocks. All hydraulic pipes have been replaced by hoses, thus reducing the number of couplings. The hoses are also thicker, leading to lower pressure falls and less heat.

Chains have replaced cylinders to control the outreach from 20 to 40 feet. The unit reaches out more evenly and with greater precision. Loading and unloading are quicker.

Environmental care is more than the green colour of the new engine

One of the greatest challenges facing the transport industry is reducing environmental impact.

At Kalmar we consider how our machines affect the environment at every stage of development, and throughout its life cycle.

Exceeding legal requirements

Generation F is equipped with Volvo Penta's new 12-litre engine. It easily fulfils prevailing legal environmental requirements, and in certain respects considerably exceeds them (stage II in accordance with EU regulations). In fact you can see the changes, as there is no visible smoke from the exhaust pipe – even at start-up.

However, the environmental improvements are also evident in several other areas. For instance, thanks to separated hydraulic and brake systems, you no longer need to handle the harmful additive Lubrizol.

Volvo Penta's 12-litre engine

The TWD1240VE is a direct injected straight six turbo. The impressive output and torque provide the extra power needed to make loading and unloading easier.

This engine also uses less fuel, largely due to the fact that it is electronically controlled and integrated in the reach-stacker's control system.

Smoother gear shift and driving

Kalmar was first on the market with its new, completely electronic gearbox – an innovation that makes for unique driving characteristics.

You can drive gently and precisely at all speeds. Four sensors optimise gear changes to produce an unrivalled smooth shift. The machine automatically starts in second, and shifts down to first when necessary.

Engine, gearbox, steering column and driving shaft – good individual components are not enough. It's important to get the various components to work together in an intelligent way.

Thanks to Kalmar's control system the entire driving system can interact optimally, resulting in unique driving characteristics.

The power is the main factor in helping achieve more efficient work cycles. Volvo Penta's 12-litre engine boasts impressive performance.

Take a close look – there is no visible smoke from the exhaust pipe. There are a whole series of environmental improvements on the Generation F.

In parallel tests with similar handling, the new 12-litre engine has displayed lower fuel consumption than the older 10-litre model.


P&O
P&O

Operational performance starts here

The cab in the Generation F is an evolution of Kalmar's world-renowned Spirit Delta driver environment.

Based on extensive research, it provides an ergonomically designed workplace where the driver can do his job more quickly, safely and efficiently.

Clear and intuitive operation

There is plenty of room on the right side of the panel to add any other equipment you may need: a communication radio, computer, monitor etc.

Several of the buttons are lit up and of the touch type. Everything is logically positioned and within easy reach.

Options for others, standard for Kalmar

With long work sessions, a good climate system is absolutely crucial. ECH (Electronic Control Heater) climate control is standard, and is governed by setting the required temperature. The recirculation air is also filtered.

Of course, you can also add a system that provides cooling (ECC).

Brings out the best in any driver

The Generation F has even more legroom. The floor spaces are open, and the new junction box is easily accessible just behind the chair. Visibility is still superb with everything positioned to allow optimum vision, and there are just as many seat and steering wheel settings as before.

The electronic joystick is standard on all Kalmar reachstackers.

Few things are as beneficial as good ergonomics. The driver environment in Generation F takes advantage of the driver's full potential. A driver who can work an entire shift without pains in the head, back, neck and feet is quite simply a more efficient driver.

The accelerator is an electronic suspended pedal. It relieves the foot and provides a completely different driving sensation compared to floor-bound mechanical pedals.

A handy safe step means drivers no longer have to use steps that are too narrow.

Ergonomics and driver environment go hand in glove with safety and optimum handling economy.

Models and options

Even the basic model of the Generation F is well-equipped. Equipment that used to be option extras now comes as standard:

Separate hydraulic and brake systems, return filters, wheel nut protection, interval wipers, tinted windows, automatic gear shifting, electronic controlled heater and a lot more.

Moreover, there is an extensive list of options that enable you to adapt the machine more precisely to your situation.

The Generation F comes with 6, 6.5, 7 and 7.5 metre wheel bases. The 8 metre wheel base and empty container are still produced as the previous ContChamp DRD model.

All lengths are available with a combi-unit. The 7 and 7.5 metre models are available with support legs.

Total fleet management

Planning and running a successful container terminal is a demanding task. Focus on core business has become a key factor in cutting operational costs and improving service.

Kalmar offers a number of solutions to help you switch from ownership to equipment availability.

Financial services
Standard or tailored financial solutions or rental agreements customised to your needs. This applies to long or short term rental.

Contract maintenance
A long-term service commitment, which comprises everything: inspections, service planning, repairs, spare parts and more.

Technical expertise service
Refurbishment and modernisation schemes for existing machines. A process that enhances efficiency and reduces costs.

Training and education
A broad range of customised training for your service engineers and truck drivers.

Field service
A worldwide service network, which covers all aspects of service, from on-call repair to complete partnership.

Spare parts
Fast worldwide delivery. On-line ordering possible.

Kalmar Terminal Development
This service is useful for planning new terminals, but also for improving efficiency of existing terminals. Analysis of existing operations and proposals for improvements, including implementation of some of the improvements is available from Kalmar Terminal Development.

With a wide customer base and product range Kalmar is in an ideal position to collect, analyse and use operational information, so that each application can be handled individually. Layout drawings, equipment and overall cost calculations are available as well as simulation including equipment utilisation.


P&O


Sea Ferries

Contact Information:

Make things easy. These three little words symbolise the Kalmar philosophy.

Making heavy things easier to handle is nothing new for Kalmar. The company has over 100 years of experience in lifting and moving heavy objects with our machines in over 160 countries around the world.

But the three little words "make things easy" also encompass another dimension. Kalmar is more than just a machine supplier. Kalmar offers solutions that make life easier for its customers, everything from driver assistance to contract maintenance and fleet management.

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