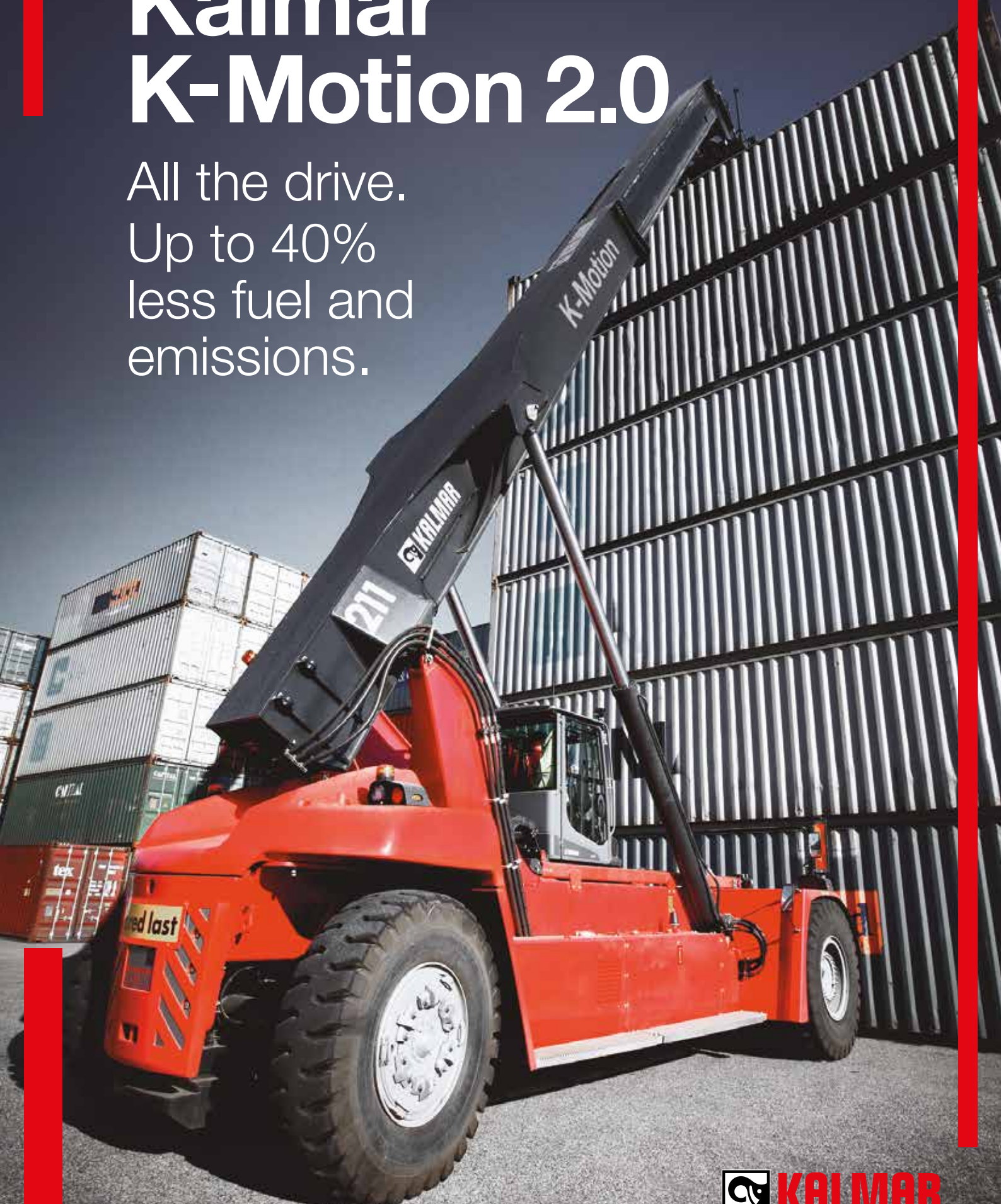


Kalmar K-Motion 2.0

All the drive.
Up to 40%
less fuel and
emissions.



Changing the rules of the game.

For many years, reducing your fuel costs and emissions meant compromising on the operational efficiency of your reachstackers, as more fuel-efficient drivelines often meant less productive machines. No longer. Kalmar has developed a unique drive-train system called K-Motion, which has recently been upgraded to version 2.0.

The upgraded Kalmar K-Motion 2.0

In our current K-Motion 2.0 upgrade you will benefit from lower power consumption when in operation and a much smoother drive. To achieve this:

- We have upgraded the hydraulics with new load sensing functionalities and optimised hydraulics functions
- And have upgraded the machine's operating software so it adapts quickly to different driving styles and applications.

K-Motion 2.0 is available with EU3 and EU4 (EPA Tier 3 and 4F) rated engines and for container, intermodal and industrial handling.

What is Kalmar K-Motion?

K-Motion 2.0 is based on our extensive experience and knowledge of hydrostatic and mechanical drivelines which has allowed us to develop a highly innovative drive-train system for reachstackers.

With Kalmar K-Motion 2.0 you can maintain your expected levels of productivity and reduce your fuel bills and emissions by up to 40%. Your operators will benefit from an improved operating environment and the ability to more precisely control the machine.

How does K-Motion work?

K-Motion is a combination of well proven transmission technologies, hydrostatic and mechanical drives, combined with smart programming, intelligent controls and a small, but highly efficient engine.

This new system operates by splitting the power sources depending on the operational needs of the machine. The hydrostatic slow speed drive, delivers smooth, efficient power while the mechanical high speed drive activates when additional power is needed.

The smart control system splits the power in the most intelligent way to maximise drive and lifting efficiency for every move you make. This allows the machine to operate with a much smaller engine than other reachstackers, giving you dramatically reduced fuel consumption, less noise and much lower emissions.

Kalmar K-Motion 2.0 is good for your business, good for the planet.

Kalmar K-Motion 2.0 can offer your business many benefits:



Fuel consumption can be reduced by up to 40%.



Operating noise is greatly reduced for operators and others nearby.



CO₂ emissions are reduced by up to 40%.



Ergonomically designed cabin for operational ease.



Less stress and pressure on the driver's body during operations.

A 30% fuel reduction.

"We have our Kalmar K-Motion connected to Kalmar SmartFleet. Everyday we measure the fuel used in combination with the number of moves made.

We see 30% less fuel consumption when we analyse the figures from the last 3-4 months".

Pascal Vermeulen
Operational and Technical
Director of the RBC Terminal,
Rotterdam.

Less fuel, less emissions.

Using less fuel will result in a direct reduction in emissions. With Kalmar K-Motion 2.0 you can expect a reduction in fuel consumption of up to 40% in comparison to older reachstackers and up to 20% with modern reachstackers. Reducing your fuel consumption means producing less CO₂ and particulate emissions.

Just the right amount of power.

Kalmar K-Motion's smart programming senses the exact weight of the load being handled. By knowing the precise weight, the system can generate the right amount of power to get the job done, further helping to reduce fuel consumption and emissions.

Further fuel savings can be achieved by installing:

- Automatic Start/Stop functionality
- Automatic Engine Shutdown
- Drive Speed Limitation
- SmartFleet Monitoring
- Eco Drive Modes (EDMs).

With Kalmar K-Motion 2.0 you can expect up to:



**40% LESS
EMISSIONS**



**40% LESS
CO₂**



**MUCH
LOWER
NOISE**

Proven in the field.

With over 70 Kalmar K-Motion machines delivered globally we have monitored their performance while operating in the field*. Initial results have shown that fuel consumed, in relation to the work done (load lifted by the distance driven), has been significantly reduced. The reduction in fuel saved has reduced costs and emissions for the operators.

* Data collected from Kalmar K-motion units running in field and compared with over 300 F and G-generation reachstackers equipped with standard drivetrains, both 3A and 4F versions.





Safer and more comfortable.

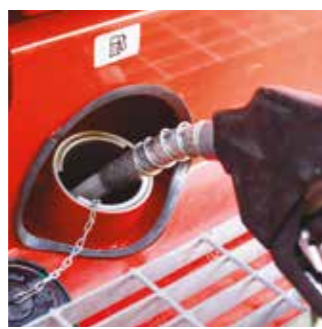
When you drive your Kalmar K-Motion reachstacker correctly, you will significantly reduce your fuel consumption and emissions by up to 40%.

How you will benefit from Kalmar K-Motion 2.0:

- Big reduction in fuel consumption
- Big reduction in exhaust emissions
- Big reduction of noise levels, inside and outside cabin
- Increased operation precision and control
- Increased driver comfort with less stresses and strains
- Increased driver efficiency and productivity
- Increased ease of operation.

Kalmar Training Academy.

Driving a Kalmar K-Motion 2.0 reachstacker is different than traditional reachstackers and, to get the most out of it, our training academy offers a range of courses for both your technicians and operators. Operators will be shown how to optimise their driving performance and what needs to be checked on the machine every day. Technicians will be given the knowledge they need to be able to keep your new equipment in top condition. Courses are a mix of theory and hands on experience and can be held at Kalmar or at your site.



Increased safety and efficiency.

Kalmar K-Motion 2.0 uses a continuous variable transmission which provides smoother transition in shifts, drive stops and direction changes. This allows the operator to drive more precisely, resulting in increased safety levels.

Easier to operate.

Kalmar K-Motion reachstackers are much easier to drive than other machines, as their smart programming does a lot of the work for you. Your drivers will no longer need to rev their engines to get the lifting and handling speeds they want, nor will they need to hold the brake pedal continually while lifting and lowering while stationary. This will dramatically reduce the strain and stress on their bodies.

Increased comfort.

Kalmar K-Motion reachstackers come fitted with our ergonomically designed EGO cabin. With slim line b-pillars, adjustable seating, steering wheel and control panel, your driver will benefit from a superior operating environment and visibility. Kalmar K-Motion, with its unique driveline, is quieter and vibrates less than traditional reachstackers, further enhancing driver comfort.



39% reduction in fuel consumption achieved.

Over a three day period it was shown that the Kalmar K-Motion DRG450 used on average 14.5 litres per hour in comparison to the Port of Tauranga's older reachstacker, which used 24 litres per hour. A reduction of over 39%.

"We were looking for reduced fuel consumption and improved operator comfort and control, as well as environmental benefits, such as lower emissions and reduced operating noise and we got them."

Shayne Jenkins
General Manager, Quality Marshalling
Port of Tauranga, New Zealand.



Kalmar Care.

Making sure your business never stops.

We offer you four different types of service and maintenance contracts, for any brand of equipment. Each is designed to help you improve your operational efficiency, drive productivity and secure financial predictability. The different contract types include a set of standardised service modules that can be tailored to meet your business needs. Opposite is an overview of the four contracts.

When the right part matters.

When something needs to be replaced you need a spare part that meets your exact needs – urgently. Kalmar offers a rapid delivery service for over 50,000 premium-quality genuine parts to anywhere in the world, with installation support if needed.

You may also want to consider outsourcing all or part of your spare parts management and inventory control, with Kalmar Parts Care. Kalmar Parts Care makes sure that critical spare parts are always on hand so your equipment downtime is kept at a minimum. Each Kalmar Parts Care plan is based on your operational needs, talk to us today and see how we can lift your parts availability, while reducing your inventory costs.

The four flexible types of service contracts.

Kalmar Support Care

We support your maintenance processes on demand.

- Availability of competent people with the right tools and parts
- Provides additional skills to existing maintenance organisation.

Kalmar Essential Care

We perform your agreed maintenance tasks proactively.

- Availability of competent people with the right tools and parts
- Higher degree of financial predictability
- Reduced operational risk to customer
- Improved availability of machines.

Kalmar Complete Care

We meet your complete maintenance requirements.

- Predictive maintenance planning
- Low operational risk to customer
- Reduced equipment downtime
- Reduced total cost of operation
- Increased operational predictability.

Kalmar Optimal Care

We optimise your business performance.

- Guaranteed availability
- Reduced tied-in capital
- Improved business performance
- Increased peace of mind.



More support.

Optimise your reachstacker with SmartFleet.

SmartFleet is a powerful equipment optimisation tool that can help you get more from your fleet. Data is streamed directly from your equipment, analysed and then displayed in an accessible and easy to use graphic interface. You will be able to assess the equipment's key performance data and make suitable changes to your operation processes to improve both efficiency and productivity.

Kalmar SmartFleet enables you to more effectively manage your container handling operations, decreases downtime and improves safety at your site.

There are many standard reports to choose from, including:

- Analyse View
- Calendar View
- Map View
- Report View

Financing options for you.

You may choose to buy your new K-Motion reachstacker outright or consider leasing or renting your equipment. There are a range of leasing and renting options that give you the financial predictability you need and the option to upgrade your equipment after a fixed period.

With our leasing package, you can focus on your core operations, while all your service and maintenance needs are covered. Kalmar can also help you with trading-in your old equipment.

No matter what your service and support needs are, make sure that you speak to your local team first.

The Kalmar container load measurement solution.

The accurate and reliable weighing of containers is an important part of safety at sea and is a mandatory requirement of the new SOLAS (Safety of life at sea) global weighing standards, from July 2016. The Kalmar container load measurement solution allows your machine to automatically measure the precise weight of your container to meet the SOLAS standards.

The Verified Gross Weight of your load is taken directly from your equipment's weighing systems and sent to the display screen in the cabin for recording. It is also possible to send the data to an on-board printer, cloud data service or create a direct connection to your TOS system.

The accuracy of this data has been certified by an independent third party to insure that it is compliant with the SOLAS standards.

K-Motion options.



Start/Stop function. An optional start/stop function can be added to automatically activate and deactivate the machine. In addition to reducing unnecessary emissions and extending the lifespan of components, this makes it possible to achieve up to 10% in fuel savings.



Tyre Pressure Monitoring System. Helps to reduce wear and tear on tyres which results in reduced fuel consumption. Bluetooth sensors keep the driver advised of the condition of the tyres. Active care of your tyres can result in a 10-40% increase in tyre life and up to a 10% decrease in fuel consumption.



Reverse Warning System (RWS). Knowing what's going on behind you is critical when other personnel are present. Four rear sensors and a reversing camera relay real-time information to an in-cabin display, alerting the driver to any dangers, increasing personnel and driver safety. You can also add additional cameras on the spreaders or on the front of the machine.



Fire Suppression System (FSS). To protect your operator and machine from fire you can fit a FSS to your machine. The system utilises multiple spray nozzles that release a high-pressure water mist where the fire has been detected from a re-chargeable water tank. This can be activated manually or automatically through an in-cabin temperature sensor.



Alco-lock. To ensure that your driver is at their best when operating your equipment, you can install an Alco-lock system. This system makes sure that the driver meets alcohol blood level standards before being able to start the machine, much like a breathalyser.



Reverse Beeper System. When your staff are working side by side with moving vehicles there is always a safety risk. Installing a reverse beeper system provides a clear acoustic alert when the machine is reversing so personnel can make sure that they are out of harm's way.



Additional lighting. Extra lighting, particularly if you operate your machine at night, as you can bring greater operational visibility and safety for personnel working on the site. You can choose additional LED working lamps on specific positions:

- 2 or 4 on the front mud guards
- 2, 4 or 6 on the lift boom
- 2 or 4 on the spreader
- 2 more on rear counter weight.



Drivelines.

KALMAR TRUCK MODELS

DRG 420 - 600

DRG 420 - 600

Engine emission approvals		EU stage 3A	US EPA Tier 3	EU stage 4	US EPA Tier 4-Final
Max emission norm values (NOx-HC-CO-PM)		3.5 - 0.5 - 3.5 - 0.2	3.5 - 0.5 - 3.5 - 0.2	0.4 - 0.19 - 3.5 - 0.025	0.4 - 0.19 - 3.5 - 0.020
Engine brand / series		Volvo Penta / D-8		Volvo Penta / D-8	
Engine model		TAD-852-VE		TAD-872-VE	
Engine after treatment type		No SCR, no AdBlue, no EGR		SCR + AdBlue + cooled EGR	
Engine fuel / type		Diesel / 4-stroke		Diesel / 4-stroke	
Engine design / cylinders		6-inline / common rail		6-inline / common rail	
Engine charger technology		Fixed Geometry Turbo (FGT)		Variable Geometry Turbo (VGT)	
Engine intercooler technology		Intercooler (air-to-air)		Intercooler (air-to-air)	
Engine displacement	(dm3 (in3))	7,700 (470)		7,700 (470)	
Engine bore x stroke	(mm (in))	110 x 135 (4.33 x 5.31)		110 x 135 (4.33 x 5.31)	
Max power @ engine speed	(kW / hp @ rpm)	210 (286) @ 1,600-2,200		210 (286) @ 1,600-2,200	
Max torque @ engine speed	(Nm / lb-ft @ rpm)	1,237 (912) @ 1,000-1,400		1,237 (912) @ 1,000-1,400	
Fuel consumption - average diesel	(L/h / gall/h)	10-15 (2,6-4,0)		10-15 (2,6-4,0)	
Fuel consumption - average AdBlue	(%)	-		1 - 5	
Alternator type - power	(W)	AC - 3,640		AC - 3,640	
Transmission brand / name / model		DANA-Rexroth / K-Motion / R2-RS		DANA-Rexroth / K-Motion / R2-RS	
Transmission clutch type		CVT (Continuous Variable Transmission)		CVT (Continuous Variable Transmission)	
Transmission model		Hydrostatic + Mechanical (Power-Split)		Hydrostatic + Mechanical (Power-Split)	
Transmission speed range (FWD - REV)		Speed range 3 - 2		Speed range 3 - 2	
Drive axle brand / series		Kessler / D102 (WDB)		Kessler / D102 (WDB)	
Service brake / cooling		Wet Disc Brakes with oil cooling		Wet Disc Brakes with oil cooling	
Steer axle brand / series		Kalmar / single cylinder		Kalmar / single cylinder	



Container Handling - Top Lift (S)



Intermodal Handling - Top Lift and Trailer Lift (C)



Industrial Handling - Tool Carrier (A)



Industrial Handling - Lift Hook (Z)





KALMAR

Making your every move count

www.kalmarglobal.com

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PRODUCT CODE/BROCHURECODE/DATE