HEAVY LIFT TRUCKS 20 – 25 TONNES.

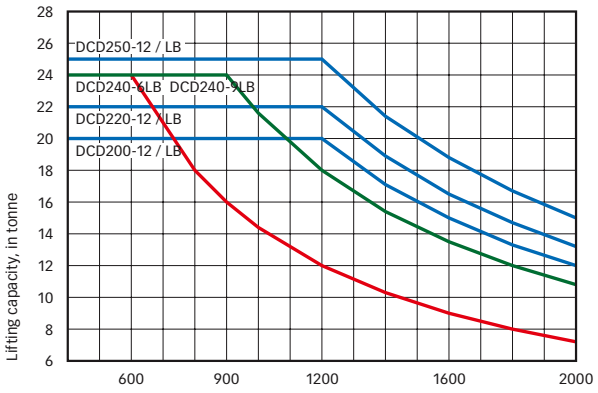
TECHNICAL INFORMATION
KALMAR DCD200-250, DIESEL, STEP 3.

Kalmar

A RANGE OF MACHINES FOR **ALL YOUR APPLICATIONS**

The Kalmar DCD 20 – 25 tonne range offers you a broad choice of alternatives to really help you get the right machine for the right type of work. Kalmar 20 – 25 tonne machines are well proven with robust design, specifically made for the most demanding applications.

This range is a result of a continuous development in practice, and together with its predecessors, these are the most common machines in the world. Every design detail is thoroughly matched against you and your colleagues' demands, so when investing in Kalmar, you are investing in optimal productivity and overall economy.



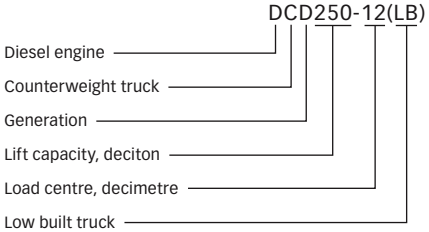
DCD 200-250 models:
Full lifting capacity up to 7000 mm lift height with duplex/duplex freelift masts, integrated sideshift/fork positioning carriage and forkshaft system.

Full lifting capacity up to 6000 mm lift height with triplex freelift masts, integrated sideshift/fork positioning carriage and forkshaft system.

KALMAR 20 – 25 TONNES

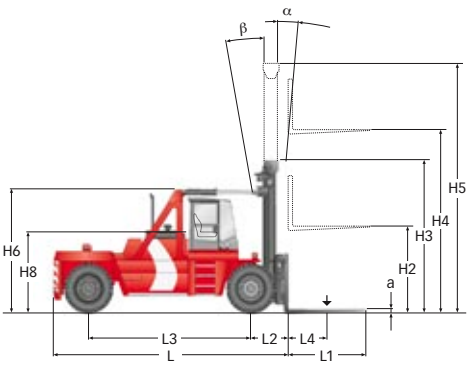
These models are well-proven and primarily dedicated to handling of heavy loads like steel, metal, concrete or stone blocks both at industrial sites and in ports and terminals. It is a comprehensive and versatile range including low-built models. Together with its compact and driver-friendly design these machines offer a productive and flexible resource to any industrial environment.

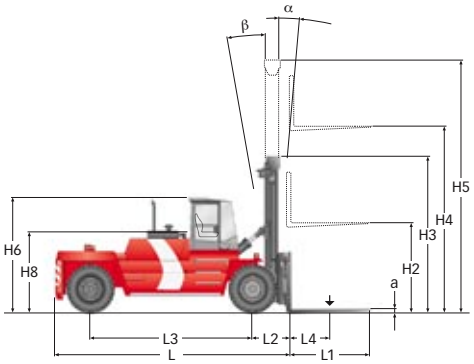
MODEL DESIGNATION

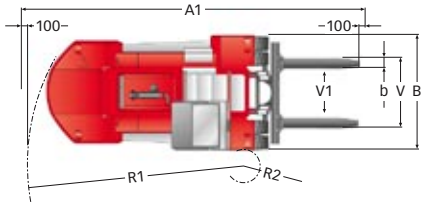


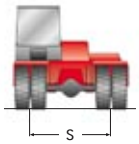
DIMENSIONS

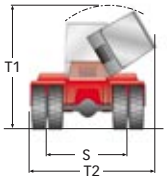
Lifting	Lift capacity	Rated		kg
		Load centre	L4	mm
Dimensions	Truck	Length, to front face of fork arm	L	mm
		Width	B	mm
		Truck height, basic machine, Spirit Delta	H6	mm
		Seat height	H8	mm
		Distance between centre of front axle – front face of fork arm	L2	mm
		Wheelbase	L3	mm
		Track (c-c), front – rear	S	mm
		Turning radius, outer – inner	R1 – R2	mm
		Ground clearance, min.		mm
		Max height when tilting cab, Spirit Delta	T1	mm
		Max width when tilting cab, Spirit Delta	T2	mm
		Minimum aisle width for 90° stacking with forks	A1	mm
	Standard duplex mast	Lifting height	H4	mm
		Mast height, min.	H3	mm
		Mast height, max.	H5	mm
		Mast tilting, forwards – backwards	α – ß	°
	Forks	Width	b	mm
		Thickness	a	mm
		Length of fork arm	l	mm
		Width across fork arm, max.	V	mm
		Width across fork arm, min.	V	mm
		Sideshift. ± at width across fork arms	V1 – V	mm
Weight	Service weight			kg
	Axle load front	Unloaded		kg
		At rated load		kg
	Axle load back	Unloaded		kg
		At rated load		kg
Wheels, brakes, steering	Wheels/tyres	Type		
		Dimensions, front – rear		inch
		Number of wheels, front – rear (*driven)		
		Pressure		MPa
	Steering system	Type – manoeuvring		
	Service brake system	Type – affected wheels		
	Parking brake system	Type – affected wheels		
Misc.	Hydraulic pressure	Max.		MPa
	Hydraulic fluid volume			l
	Fuel volume			l









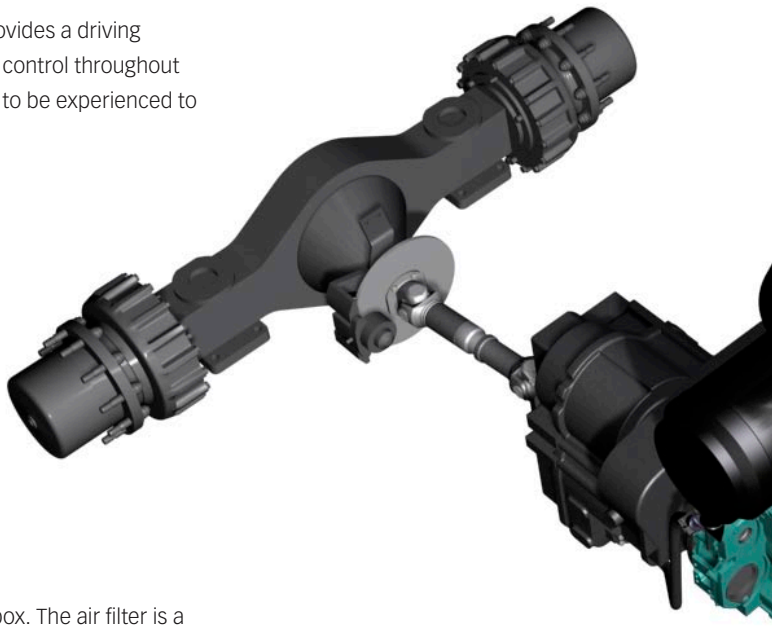


	DCD 200-12	DCD 200-12LB	DCD 220-12	DCD 220-12LB	DCD 240-6LB	DCD 240-9LB	DCD 250-12	DCD 250-12LB
	20000		22000		24000		25000	
	1200		1200		600	900	1200	
	6060		6070		5710		6320	
	3050		3050		3050		3050	
	3450	3270	3450	3270	3270		3450	3270
	2150		2150		2150		2150	
	1060		1070		1060		1070	
	4000		4000		3650		4250	
	2200 – 2140		2200 – 2140		2200 – 2140		2200 – 2140	
	5500 – 550		5500 – 550		5100 – 250		5800 – 450	
	300		300		300		300	
	–	3800	–	3800	3800		–	3800
	–	3700	–	3700	3700		–	3700
	9160		9170		8760		9470	
	5000		5000		5000		5000	
	4320		4320		4320		4320	
	6820		6820		6820		6820	
	5 – 10		5 – 10		5 – 10		5 – 10	
	250		250		250		250	
	100		110		100		110	
	2400		2400		2400		2400	
	2600		2600		2600		2600	
	1000		1000		1000		1000	
	400 – 1800		400 – 1800		400 – 1800		400 – 1800	
	29800		31200		29400	31900	32900	
	15000		15000		15000		15500	
	46300		49500		49900	51900	53800	
	14800		16200		14400	16900	17400	
	3500		3700		3500	4000	4100	
	Pneumatic		Pneumatic		Pneumatic		Pneumatic	
	14.00x24 – 14.00x24		14.00x24 – 14.00x24		14.00x24 – 14.00x24		14.00x24 – 14.00x24	
	4* – 2		4* – 2		4* – 2		4* – 2	
	1,0		1,0		1,0		1,0	
	Hydraulic servo – Steering wheel							
	Oil cooled disc brakes (Wet disc brakes – Drive wheels)							
	Dry, spring activated disc brake – Drive wheels							
	18,0		15,0		16,0		16,5	
	270		270		260		320	
	300		300		230		350	

THE BASE FOR **HIGH PERFORMANCE**

We have equipped the Kalmar 20 – 30 tonne range with excellent drive trains. Engine, gearbox, drive shaft and wet disc brakes – everything has been built and combined into a unit with the highest performance and durability possible.

The new drive trains provides a driving experience and level of control throughout the work cycle that has to be experienced to be believed.



POWERFUL LOW EMISSION ENGINES

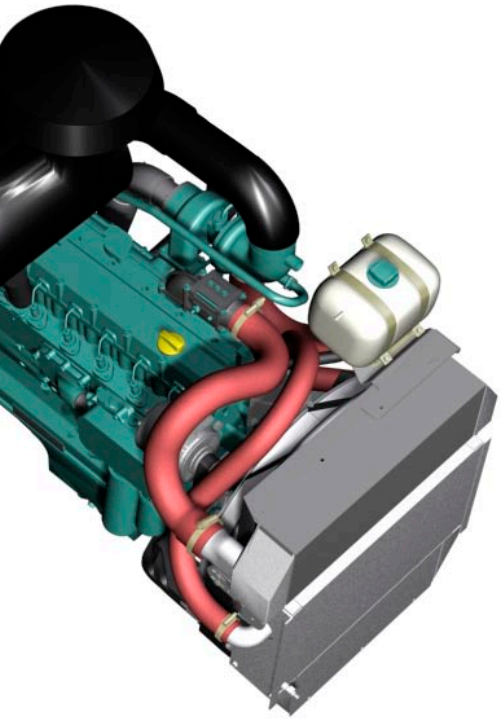
We can offer two different power trains. The engines provide high torque even at low revolutions. The engines fall well within the latest emission requirements and they also conform to the new noise power standards.

Stage 3 engines require more powerful cooling than before and the trucks come fitted with an efficient and easy-to-service split cooling system – for air and fuel and coolant to the engine and gearbox. The air filter is a two-stage Donaldson with a pre-cleaner in stage one and a finer cellulose filter for the smallest particles in stage two. This can also be replaced by a metallic or dust particle filter as an option. The filter has a high cleaning capacity and is easy to replace.

ELECTRONIC CONTROLLED TRANSMISSION

We are using the Dana TE17000 series transmission. The gearbox has integrated electronic control, monitoring and intelligence. The gearbox has built-in reversing lock and modulation, providing safe and smooth gear changing. In addition we also calibrate slipping before delivery to provide the best gear-changing characteristics depending on power train, wheel dimension and drive shaft.

There are two optional grades of “intelligence” to choose: automatic gear-changing and electronic inching with controlled slipping.



THE RELIABLE
DISTRIBUTED CONTROL SYSTEM

Kalmar's electronic system is a fast, intelligent and stable auxiliary electronic system that makes the truck user-friendly, effective, safe and economical. Kalmar's electrical system has been thoroughly upgraded through development. The installation is more standardised and simplified using CAN-bus technology. Furthermore, updated software and electrical components were incorporated to deliver a high level of flexibility, ease of maintenance and durability.

Distance since last service and hours to next service.

The Kalmar 20 – 30 tonne range is equipped, as standard, with a very simple and non-language-specific interface for the information located on the steering wheel display. Information is provided in three areas – diagnostics, operation and alarms. The standard control system monitors the engine and gearbox and gives feedback to the operator in the display. There are plenty of options available, i.e ergonomic functions such as lever and mini steering wheel control.

DRIVE AND STEERING AXLE

The steering system is a well proven robust design with a double acting cylinder and a pendulum suspension. The strength and the durability is obvious when you look at the steer axle.

The drive axle has a robust design in order to cope with extreme stresses in tough working environments with heavy loads, high intensity operations and even towing tasks. The drive axle has a two stage reduction to ensure minimum strain on the transmission system- differential and hub reduction.

The axle is fitted with a hydraulic service brake system (Wet Disc Brake). It is also fitted with the dry disc parking brake actuated electronically via switch in the cabin.

The service brake system is of the Wet Disc Brake type, a well-proven system comprised of a set of fixed and a set of rotating oil-cooled discs. When the brakes are applied, the discs are pressed together by hydraulic pressure from the brake pedal. This provides an extremely effective and smooth braking system which can cope with heavy stresses over an extended period of time without any risk of overheating or fading.

The system is virtually maintenance free with almost no wear and tear and need for brake adjustments. The heat generated during the braking is transmitted via a cooling circuit which effectively uses the truck's total volume of hydraulic fluid.

POWER TRAINS AND **PERFORMANCE**

DRIVE TRAINS – TIER III					Volvo TAD750VE (181kW) Dana TE17000	Cummins QSB 6,7 (194kW) Dana TE17000
Drive train	Engine	Manufacturer – type designation			Volvo – TAD750VE (Turbo-Intercooler)	Cummins – QSB 6,7 (Turbo-Intercooler)
		Fuel – type of engine			Diesel – 4-stroke	Diesel – 4-stroke
		Rating ISO 3046 – at revs	kW/hp(metric) – rpm		181/246 – 2300	194/264 – 2200
		Peak torque ISO 3046 – at revs	Nm – rpm		1050 – 1500	990 – 1400
		Number of cylinders – displacement		cm^3	6 – 7145	6 – 6702
		Fuel consumption, normal driving		l/h	13-15	13-15
	Gearbox	Manufacturer – type designation			Dana TE17000	Dana TE17000
		Clutch, type			Torque converter	Torque converter
		Gearbox, type			Hydrodynamic Powershift	Hydrodynamic Powershift
		Numbers of gears, forward – reverse			3 – 3	3 – 3
	Alternator	Type – power		W	AC – 2240	AC – 1960
	Starting battery	Voltage – capacity		V – Ah	2×12 – 140	2×12 – 140
	Driving axle	Manufacturer – type			Kessler D91 – Diffrential and hub reduction	Kessler D91 – Diffrential and hub reduction

VOLVO TAD750VE					DCD200-12		DCD220-12		DCD 240-6LB	DCD 240-9LB	DCD250-12	
					•	LB	•	LB			•	LB
Performance	Lifting speed	Unloaded		m/s	0,35	0,35	0,27	0,27	0,27	0,27	0,27	0,27
		At rated load		m/s	0,30	0,30	0,25	0,25	0,25	0,25	0,25	0,25
	Lowering speed	Unloaded		m/s	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30
		At rated load		m/s	0,40	0,40	0,40	0,40	0,40	0,40	0,40	0,40
	Travelling speed, forward and reverse	Unloaded		km/h	28	28	28	28	28	28	28	28
		At rated load		km/h	27	27	27	27	27	26	26	26
	Gradeability	Max.	unloaded	%	78	78	73	73	80	70	67	67
			at rated load	%	38	38	35	35	35	33	32	32
		At 2 km/h	unloaded	%	52	52	49	49	53	48	46	46
			at rated load	%	28	28	26	26	26	24	23	23
	Drawbar pull	Max.		kN	186	186	186	186	186	186	186	186
Noise	Noise level according to EN12053	LpAZ (inside) Spirit Delta		dB(A)	72	72	72	72	72	72	72	72
	Noise level according to 2000/14/EC*	LwA (outside)		dB(A)	110	110	110	110	110	110	110	110

CUMMINS QSB 6,7					DCD200-12		DCD220-12		DCD 240-6LB	DCD 240-9LB	DCD250-12	
					•	LB	•	LB			•	LB
Performance	Lifting speed	Unloaded		m/s	0,35	0,35	0,27	0,27	0,27	0,27	0,27	0,27
		At rated load		m/s	0,30	0,30	0,25	0,25	0,25	0,25	0,25	0,25
	Lowering speed	Unloaded		m/s	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30
		At rated load		m/s	0,40	0,40	0,40	0,40	0,40	0,40	0,40	0,40
	Travelling speed, forward and reverse	Unloaded		km/h	28	28	28	28	28	28	28	28
		At rated load		km/h	27	27	26	26	26	26	26	26
	Gradeability	Max.	unloaded	%	90	90	83	83	92	80	76	76
			at rated load	%	42	42	39	39	39	37	35	35
		At 2 km/h	unloaded	%	59	59	56	56	61	54	52	52
			at rated load	%	31	31	29	29	28	27	26	26
	Drawbar pull	Max.		kN	201	201	201	201	201	201	201	201
Noise	Noise level according to EN12053	LpAZ (inside) Spirit Delta		dB(A)	74	74	74	74	74	74	74	74
	Noise level according to 2000/14/EC**	LwA (outside)		dB(A)	112	112	112	112	112	112	112	112

* including noise reduction kit
** only for use outside EU (noise reduction kit is not included)

DRIVING ENVIRONMENT FOR **OPTIMAL PERFORMANCE**

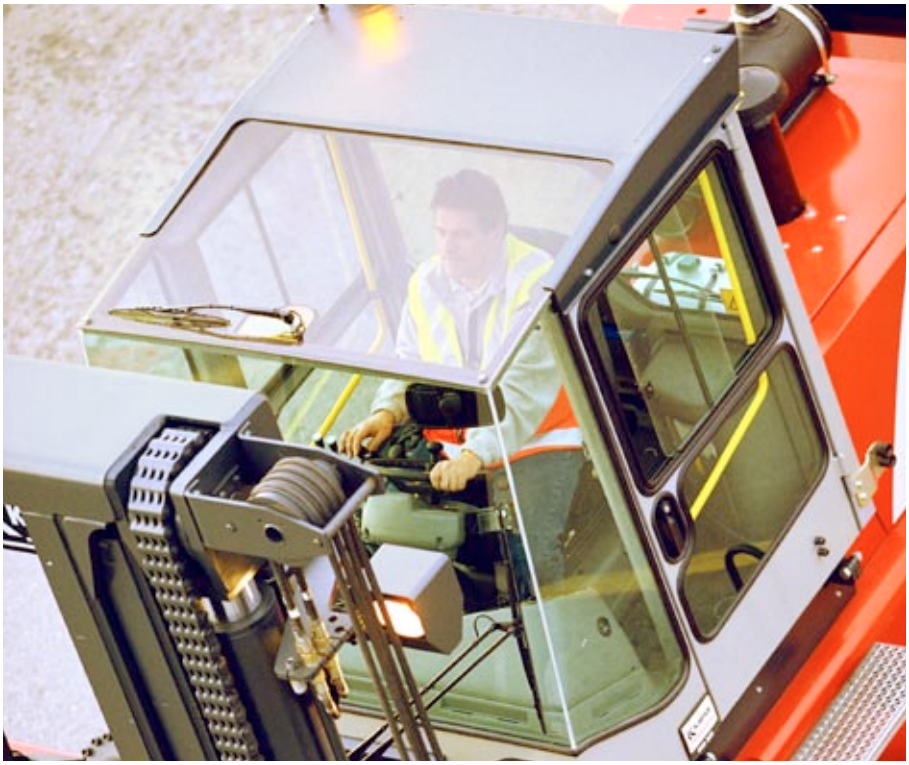
SPIRIT DELTA

Spirit Delta is one of the best designed driving environments available in the industry. Priority has been given to ergonomics for the driver. After a demanding shift in a Spirit Delta, the driver should be alert and attentive, resulting in improved working safety.

The overall design and all the adjustment options mean that the Spirit Delta will benefit every driver. Instruments and control layout allow the driver to see at a glance and have control over all the machine's various functions, while at the same time allowing the driver to work in an efficient and relaxed way.

Comfort, with regard to noise level, climate, lighting and accessibility is at the highest level possible.

The operator of the Spirit Delta can have access to Kalmar's range of intelligent efficiency and safety options in one place.



Excellent visibility from operator's position.

Hydraulic or electric servo control by levers.

Spirit Delta with Climate Control System, ECC (option).

Driver's seat with mechanical or air assisted adjustments.

LIFTING **EQUIPMENT**

The Kalmar DCD 20 – 25 tonne range offers you a comprehensive range and choice of masts, carriages, forks and attachments. Altogether you can specify your machine exactly according to your needs. The lifting equipment is well proven and continuously improved to match the increasing requirements for fast, accurate and safe handling, whatever the application.

Duplex mast
standard, free visibility

Duplex mast
full free lift, free visibility

MASTS

All masts are constructed on the free visibility principle and can be supplied with the area controlled free-lift system which, in terms of function, is extraordinary reliable and secure.

The robust mast profiles of high tensile steel are designed for high stresses and long life. The positioning of profiles improve the visibility from the operator's seat by minimising obstruction of the field of vision. The cylinders contribute to this as well and are positioned in the "dead" angles of the mast.

The long-life mast wheels are fitted with high quality conical roller bearings.

The standard lifting equipment for all models is the duplex, visibility mast.

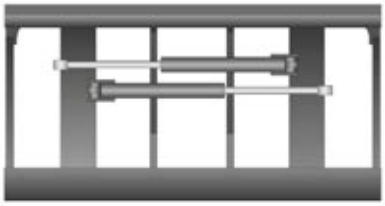
MAST

	Lift height H4	Mast height		Free-lift H2
		H3 min.	H5 max.	
Duplex,standard,free visibility	4000	3820	5820	–
	4500	4070	6320	–
	5000	4320	6820	–
	5500	4570	7320	–
	6000	4820	7820	–
	6500	5070	8320	–
	7000	5320	8820	–
Duplex, full free lift, free visibility	4000	3920	5920	2000
	4500	4170	6420	2250
	5000	4420	6920	2500
	5500	4670	7420	2750
	6000	4920	7920	3000
	6500	5170	8420	3250
	7000	5420	8920	3500
Triplex, full free lift, free visibility	5150*	3700	6950	1900
	5850	3950	7700	2100
	6275	4100	8150	2225
	7250	4450	9200	2500
	6000	–	–	–
	7000	–	–	–
	7500	–	–	–

* Note! Lifting height 5150 mm only available for LB (low built model).
For other lifting heights, please contact Kalmar.

FORK CARRIAGES

The fork carriages are, in most deliveries, supplied with hydraulic side-shift and fork positioning. Our carriages are designed for optimal visibility and wider carriages available as an option.



Fork carriage

FORKS

The forks are a one-piece forged design manufactured from high tensile steel and fitted with four upper rollers and two lower rollers on each fork. A solution which provides both accurate and smooth fork movements as well as long service life.

To improve handling flexibility and ease of changing between forks and other attachments, a fork shaft system is available. In this case the forks are mounted on a separate fork holder.

Standard roller forks

Fork shaft system

Inverted forks

ATTACHMENTS

For the Kalmar 20 – 25 tonne models there are a number of attachments available, which considerably extend the traditional fork lift truck area of operation.

Attachments like coil rams for steel and metal applications and different toplifts for container handling are also available.

Coil ram

Toplift attachment

A QUALITY MACHINE
FOR OPTIMUM OVERALL ECONOMY

REDUCING OPERATING COSTS

The Kalmar 20 – 25 range consists of a series of models that have been designed in every aspect to provide long life with minimum downtime. This has been achieved by using technical solutions and components, and by not subjecting the truck to built in stresses that result in unnecessary wear and higher costs.

In addition, we utilise optimised chassis modules, frames, electronically controlled power trains, wet disc brakes, more reliable and more efficient hydraulic systems.

The air filter is easy accessible under the bonnett.

Daily inspection is simple.

Hole in the bonnet for fire fighting.

FAST SERVICE AND MAINTENANCE

The Kalmar 20 – 25 tonne range has been designed to provide the best possible access for maintenance. Tilting the cabin (LB version) and opening the engine cover exposes the entire power train with easy accessibility to all vital components and service points.

PARTS AND SERVICE

The final piece that makes the DCD200-250 a pre-eminent team player is parts & service. Kalmar has a truly comprehensive programme of service for ownership, rental, and much more.

All machines will need parts and service sooner or later and there is no difference with Kalmar. What differentiates Kalmar is the excellent after market support. Kalmar is well prepared with warehouses in all continents and local distribution centres for parts through either sales companies or dealers. Kalmar's long experience and global presence provide excellent customer service all around the globe.

SAFETY AND THE ENVIRONMENT

The Kalmar DCD200-250 is CE marked (only EU) and its construction complies with the following standards:

- The Machinery Directive 98/37/EC
- The EMC Directive 89/336/EC
- The Noise Emission Directive 2005/88/EC
- The Exhaust Gas Directive 2004/26/EC

WORLDWIDE
APPLICATION KNOWLEDGE

Handling of loaded 20’ containers with forks.

DCD240-6LB with coil ram in steel operation.

Heavy asymetrical loads in tough stone operation.

DCD300-12LB equipped with a tyre handling attachment in the mining industry.

FOUR REASONS TO **CHOOSE KALMAR.**

1 / COST OVER LIFETIME

Kalmar offers the best cost over lifetime for its customers. Modern and innovative technology together with lasting equipment and comprehensive service ensures Kalmar increases its customers' productivity. Every day.

2 / GLOBAL NETWORK

Kalmar invests in its sales and service network. Thus Kalmar is a reliable and trustworthy supplier with ability to serve demanding customers.

3 / LOCAL SERVICE

Kalmar practises innovative service development. Because of Kalmar's local customer service strategy, Kalmar knows its customers' local conditions, and can provide efficient and effective service in every location.

4 / CONTINUOUS DEVELOPMENT

Kalmar has not stopped at the top, but continuously improves its offering. New services as well as investments in automation and environmentally friendly solutions work for our customers benefit.

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