

EMPTY CONTAINER HANDLERS 8 – 10 TONNES.
TECHNICAL INFORMATION
KALMAR DCF80-100, E5-E8.



THE RESULT OF A TECHNICAL EVOLUTION

Kalmar has for a long time been developing machines especially adapted to the handling of empty containers. Now we have brought our empty container handlers in to the new generation, the Kalmar F series – the technical platform that represents a major technical revolution in container handling.

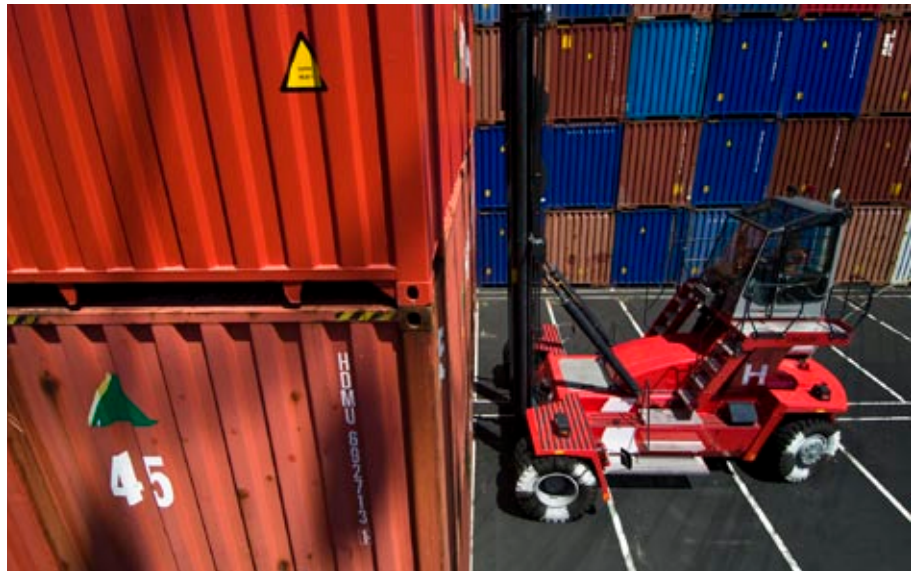
The DCF80-100 is a high quality machine that allows you to move as many units as possible in the shortest amount of time in the most profitable way. In order to get the optimum balance of economy, lifting height and performance for each client, Kalmar offers a wide range of empty container handlers.

As for all Kalmar F series machines safety is a key factor. The DCF80-100 can provide the best everyday performance and at the same time reassure the safety of the personnel. The components are well-known and are often found in other Kalmar machines and have therefore been tested through an extended time and can provide the highest possible reliability.

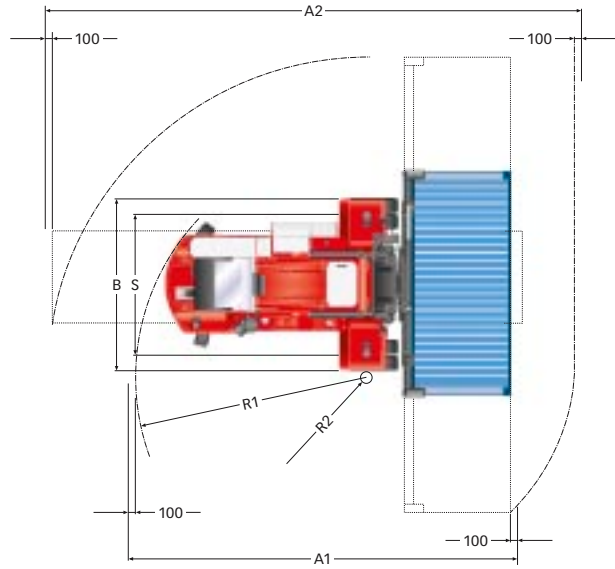
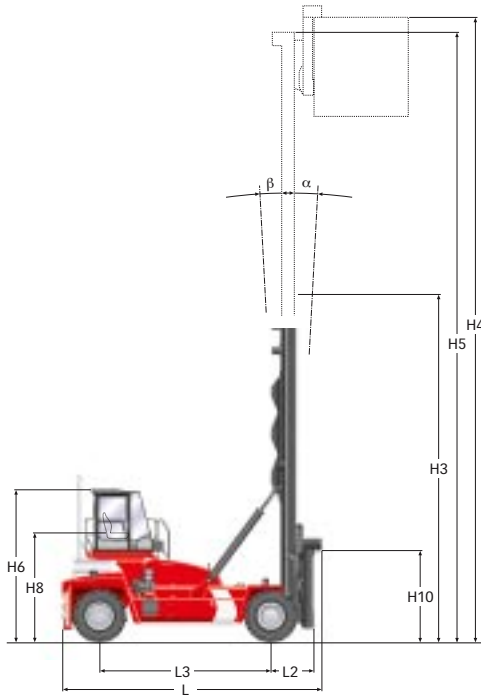
EFFICIENT AND RELIABLE

The design of the chassis, mast and spreader has resulted in a machine with very good dimensional, stability and operational characteristics. These combined allow the operator to focus on the task instead of the management of the machine.

Additionally, we have ensured that every single detail, component and system have been selected and manufactured to provide the highest possible reliability. When we deliver the machine we want to make sure that all aspects are factored in. Once produced all machines go through an extensive testing programme before they leave the factory in order to secure a high level of reliability.



DIMENSIONS				
Lifting	Lift capacity	Rated		kg
		Load centre	L4	mm
		Number of containers	8'6" container 9'6" container	
Dimensions	Truck	Length of truck	L	mm
		Width	B	mm
		Height, basic machine	H6	mm
		Seat height	H8	mm
		Distance between centre of front axle – front face of attachment	L2	mm
		Wheelbase	L3	mm
		Track (c-c), front – rear	S	mm
		Turning radius, outer	R1	mm
		Turning radius, inner	R2	mm
		Ground clearance, min.		mm
	Min. aisle width for 90° stacking with attachment	8'6" container 9'6" container	A1	mm
	Standard duplex mast	Lifting height	H4	mm
		Mast height, min.	H3	mm
		Mast height, max.	H5	mm
		Mast tilting, forwards – backwards	$\alpha - \beta$	°
Ground clearance, min.			mm	
Attachment	Width	b	mm	
	Height under twistlock	H10	mm	
	Height under hooks	H10	mm	
	Sideshift \pm	V1	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 and 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	



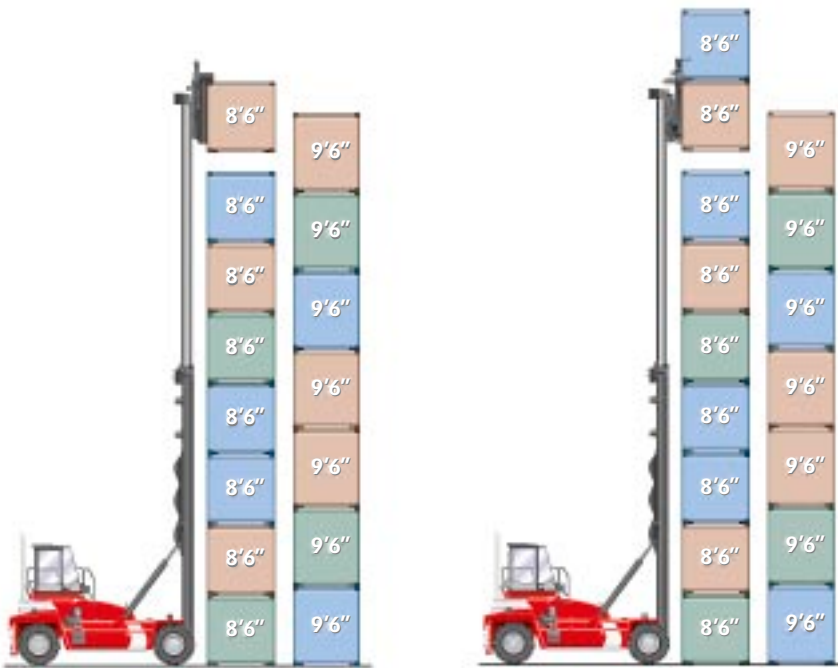
DCF80-45				DCF90-45				DCF100-45			
E5	E6	E7	E8	E5	E6	E7	E8	E5	E6	E7	E8
8000	8000	8000	8000	9000	9000	9000	9000	10000	10000	10000	10000
1220	1220	1220	1220	1220	1220	1220	1220	1220	1220	1220	1220
5	6	7	8	5	6	7	8	5+1	6+1	7+1	8+1
5	5	6	7	5	5	6	7	5+1	5+1	6+1	7+1
6900	6900	6900	6900	6900	6900	6900	6900	6900	6900	6900	6900
4000	4000	4000	4500	4000	4000	4000	4500	4500	4500	4500	4500
3940	3940	3940	3940	4000	4000	4000	4000	4000	4000	4000	4000
2800	2800	2800	2800	2900	2900	2900	2900	2900	2900	2900	2900
1170	1170	1170	1170	1170	1170	1170	1170	1240	1240	1240	1240
4550	4550	4550	4550	4550	4550	4550	4550	4550	4550	4550	4550
3270 – 2250	3270 – 2250	3270 – 2250	3750 – 2250	3270 – 2250	3270 – 2250	3270 – 2250	3750 – 2250	3750 – 2250	3750 – 2250	3750 – 2250	3750 – 2250
6000	6000	6000	6200	6200	6200	6200	6200	6200	6200	6200	6200
2000	2000	2000	2200	2200	2200	2200	2200	2200	2200	2200	2200
250	250	250	250	300	300	300	300	-	-	300	300
10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000
14000	14000	14000	14000	14000	14000	14000	14000	14000	14000	14000	14000
15180	16180	18680	21180	15240	16240	18740	21240	15300	16300	18800	21300
8540	9040	10290	11540	8600	9100	10350	11600	8600	9100	10350	11600
15040	16040	18540	21040	15100	16100	18600	21100	15100	16100	18600	21100
3 – 3	3 – 3	3 – 3	3 – 3	3 – 3	3 – 3	3 – 3	3 – 3	3 – 3	3 – 3	3 – 3	3 – 3
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
2180	2180	2180	2180	2240	2240	2240	2240	-	-	-	-
-	-	-	-	-	-	-	-	2300	2300	2300	2300
600	600	600	600	600	600	600	600	600	600	600	600
36450	37100	38725	40350	37300	37950	39575	41200	40100	40750	42375	44000
23900	24550	26175	27800	24100	24750	26375	28000	25600	26250	27875	29500
36050	36700	38325	39950	37700	38450	40075	41700	40800	41550	43175	44800
12550	12550	12550	12550	13200	13200	13200	13200	14500	14500	14500	14500
8400	8400	8400	8400	8500	8500	8500	8500	9200	9200	9200	9200
Pneumatic				Pneumatic				Pneumatic			
12.00x24 – 12.00x24				14.00x24 – 14.00x24				14.00x24 – 14.00x24			
4* – 2	4* – 2	4* – 2	4* – 2	4* – 2	4* – 2	4* – 2	4* – 2	4* – 2	4* – 2	4* – 2	4* – 2
1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	-	-	1,0	1,0
Servo assisted – Steering wheel				Servo assisted – Steering wheel				Servo assisted – Steering wheel			
Wet disc brakes – Drive wheel				Wet disc brakes – Drive wheel				Wet disc brakes – Drive wheel			
Spring brake – Drive wheel				Spring brake – Drive wheel				Spring brake – Drive wheel			
19,0	19,0	19,0	19,0	20,0	20,0	20,0	20,0	22,5	22,5	22,5	22,5
320	320	320	320	320	320	320	320	320	320	320	320
380	380	380	380	380	380	380	380	380	380	380	380

PROTECTIVE AND SAFE WITH TOTAL CONTROL

The lifting equipment of Kalmar DCF is an integrated assembly consisting of mast, carriage, spreader, hydraulics and control system. This is to ensure you get a reliable and good running machine with high availability even after long shifts and high load stresses.

To leverage operational productivity it's essential that the driver has full control over every moment of the handling sequence. The open design of the mast optimises the visual contact with the stack, container corners, twistlock and spreader

Lifting as much as 8+1 high puts high demands on sturdiness of the equipment. Stronger dimension on the tilting cylinders and with the top section threaded into the cylinder creates a robust lifting equipment.



SINGLE AND DOUBLE STACKING

Kalmar has developed empty container handling concepts for both single- and double stacking for different lifting heights. Our DCF Empty range stretches from a capacity of 5 high up to 8+1 high. The decision on which concept is most suitable is depending on individual operational demands.

The open design of the mast optimises the visual contact with the stack, container corners, twistlocks and spreader.

SINGLE STACKING WITH TWISTLOCKS

The single handling concept starts at 5 high stacking and up to 8 high. Characteristic for the machines dedicated for single stacking is flexibility, stability and high lifting speeds.

Twistlock attachments are widely used on many Kalmar machines over the globe.

High demands on selectivity and limitations in ground space are the key factors when considering on single stacking equipment.

DOUBLE STACKING WITH HOOKS

Double stacking of containers is an important step in increasing the productivity in the empty container handling business. Double stacking can be a very demanding application for the Empty Container Handler. The new DCF100 model from Kalmar fulfils these high requirements of stability and strength with margin. Stacking two containers simultaneously is most of all a question of extreme demands of operational efficiency before demands on selectivity.

MAST

All machines in the DCF80-100 series are equipped with the sturdy 10 tonne mast, designed according to the free visibility principle. The mast profiles are made of high tensile steel, designed for minimal obstruction of the field of vision and for long service life with minimal deflection at high lifting heights.

The mast is made for high reliability and simple maintenance. It requires only two hoses and one cable passing over the mast roller to feed the hydraulic and electrical functions of the spreader.

CARRIAGES

Two integrated carriages are available. Which one you choose depends on if the spreader is landing from above (twistlocks) or from the front side of the container (hooks). All carriages have support wheels to bear longitudinal stresses and sliding plates for lateral stresses.

The choice of carriages, is depending on the handling type, single or double stacking. Single with mechanical levelling and hydraulic levelling for double stacking. Available as an option is a carriage with hydraulic leveling for twistlocks.

The fixed carriage for attachment with twistlocks has mechanical levelling as standard and hydraulic as option. The hook attachment has a hydraulic levelling.



Carriage with passive levelling, standard on DCF80-90 for single stacking



Carriage with mechanical levelling, available as option on DCF80-90 for single stacking.



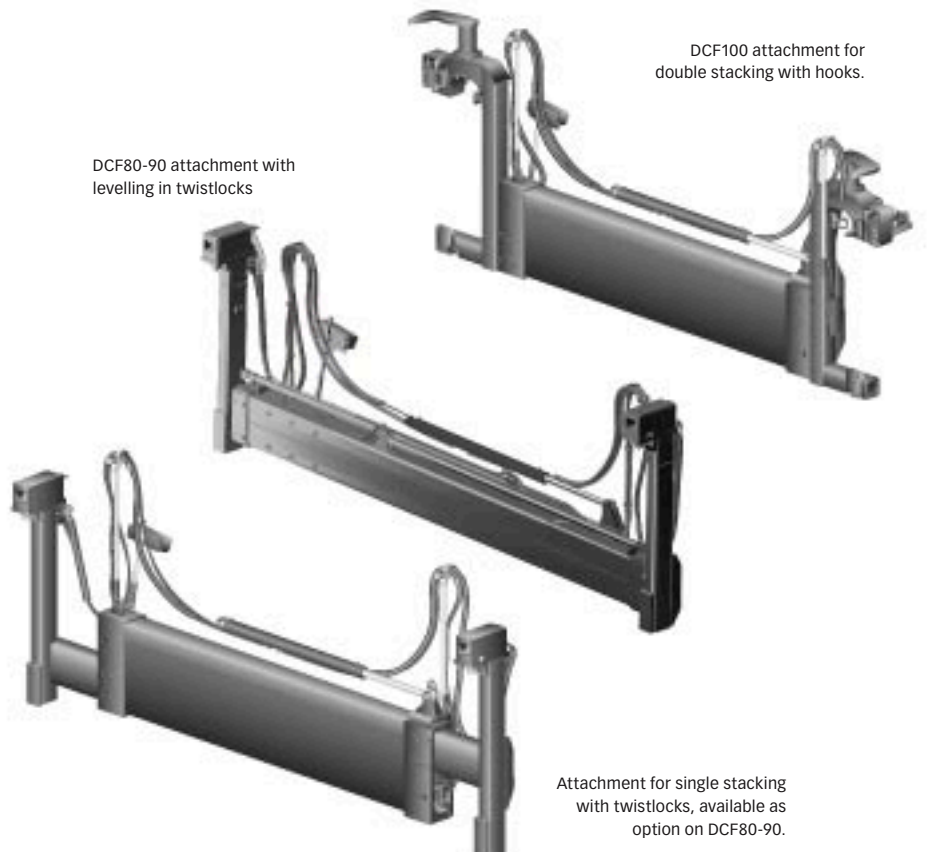
Carriage with hydraulic levelling. Standard on DCF100 for double stacking and option on DCF80-90 for single stacking

ATTACHMENTS

DCF80-90 are equipped with twistlock attachments. DCF100 is equipped with a C-hook attachment for double stacking. Both the hook and twistlock attachments have a hydraulic cylinder between the attachment and the carriage that allows ± 600 mm side-shift.

The levelling function on the twistlock attachment is enabled by the mobility on each twistlock. This gives a simpler construction which offers increased reliability and easier servicing.

The locking- and unlocking procedure is made easier through individual monitoring of the twistlocks. To guarantee good visibility when handling the containers in dark conditions the working light is placed on the mast directed towards the twistlock, independent of the spreader extension.



DCF100 attachment for double stacking with hooks.

DCF80-90 attachment with levelling in twistlocks

Attachment for single stacking with twistlocks, available as option on DCF80-90.

ENGINEERED TO OPTIMISE PERFORMANCE

A key factor for productivity is the basic machine setup. We have put highest priority on overall technical reliability and how the components comes together, all functions must perform optimally even after heavy use.

1 CHASSIS

The chassis creates the base for the machine's external dimensions, stability and manoeuvre characteristics. All chassis are built of fully welded steel profiles, which give a rigid design with strong mounting points for the drive axle and lift equipment. Stress concentrations have been eliminated for optimum tensile strength.

The chassis has a low profile for good visibility. The tanks are separately mounted and bolted to the chassis in a position that also contributes to good visibility. The cabin on each model is located for best visibility. The DCF80-100 series come in two different versions regarding the cabin position. Depending on market requirements the machines can be delivered with standard cabin height position or as an elevated version. This decision is depending on individual operational requirements.

2 ENGINE

The Cummins and Volvo engines provide power for driving and the working hydraulics. The engines are low-emission turbo diesels with fuel injectors and intercoolers. The design of the combustion chambers, along with the precise fuel injection control, ensures more efficient combustion to provide lower emissions with increased torque and power. The engines meet the Tier 3 requirements, and the sound and vibration standards.

The radiator is a 3 chamber design with a single fan to provide cooling for the engine and transmission. The engine cooler's separate expansion chambers are fitted with a level sensor that indicates low coolant level.

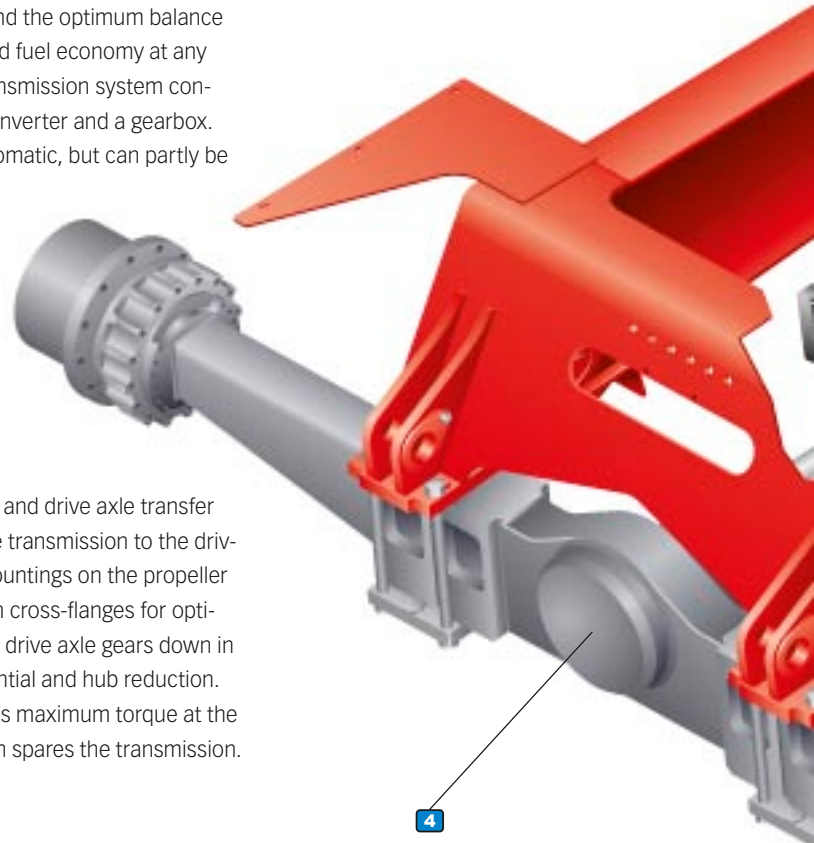


3 TRANSMISSION

The transmission is electronically controlled in the DCF. It transfers power from the engine to the hydraulic pumps and drive line. The engine and gearbox control systems work together to find the optimum balance between power and fuel economy at any given time. The transmission system consists of a torque converter and a gearbox. The gearbox is automatic, but can partly be shifted manually.

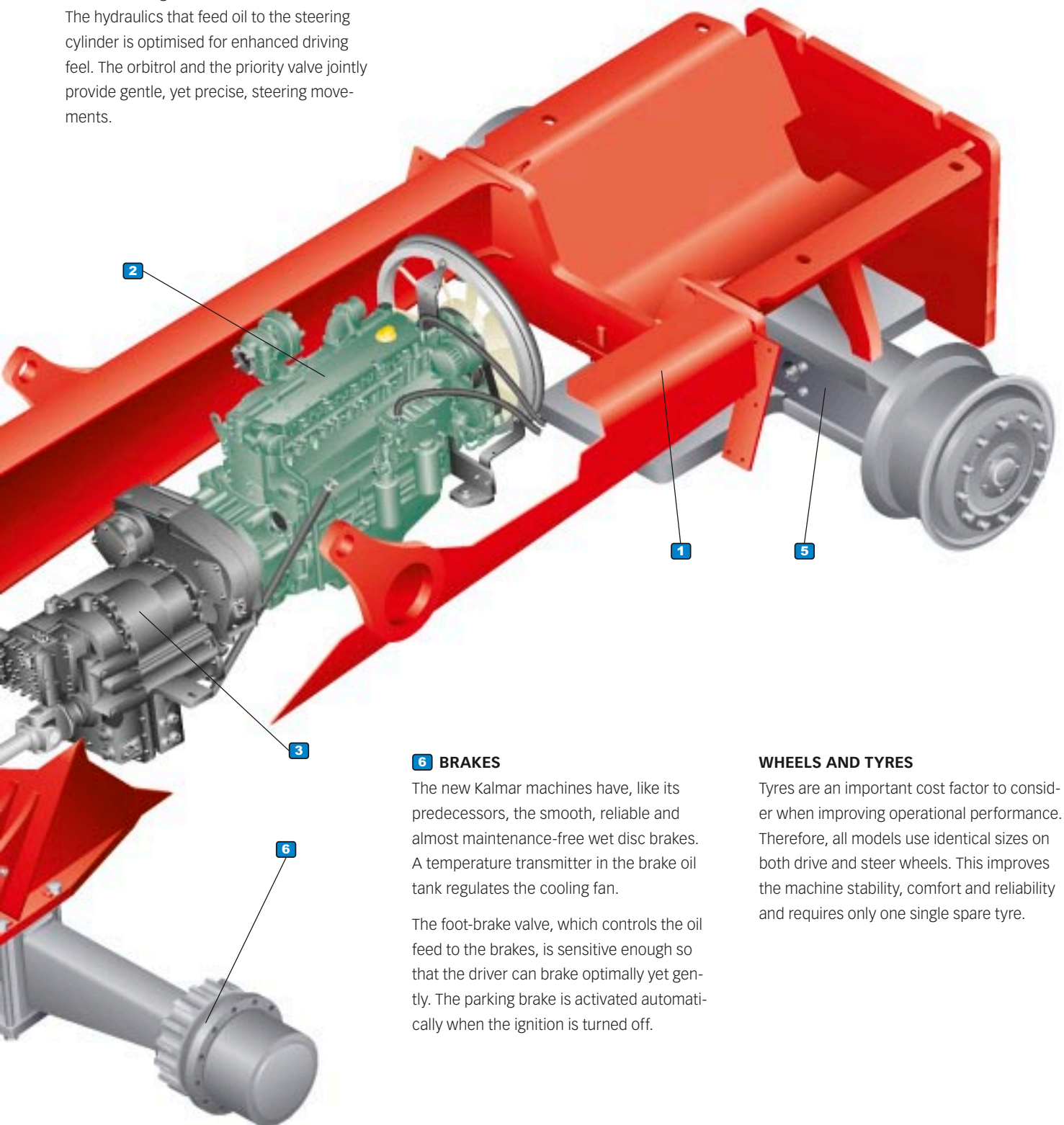
4 DRIVE LINE

The propeller shaft and drive axle transfer the power from the transmission to the driving wheels. The mountings on the propeller shaft are fitted with cross-flanges for optimum strength. The drive axle gears down in two stages, differential and hub reduction. The engine provides maximum torque at the drive wheels, which spares the transmission.



5 STEERING SYSTEM

The steering axle is built from a single piece of high strength steel, which means fewer parts requiring less maintenance and higher structural integrity. The suspension points on the steering axle are maintenance free. The hydraulics that feed oil to the steering cylinder is optimised for enhanced driving feel. The orbitrol and the priority valve jointly provide gentle, yet precise, steering movements.



6 BRAKES

The new Kalmar machines have, like its predecessors, the smooth, reliable and almost maintenance-free wet disc brakes. A temperature transmitter in the brake oil tank regulates the cooling fan.

The foot-brake valve, which controls the oil feed to the brakes, is sensitive enough so that the driver can brake optimally yet gently. The parking brake is activated automatically when the ignition is turned off.

WHEELS AND TYRES

Tyres are an important cost factor to consider when improving operational performance. Therefore, all models use identical sizes on both drive and steer wheels. This improves the machine stability, comfort and reliability and requires only one single spare tyre.

DRIVE TRAINS AND PERFORMANCE

DRIVE TRAINS – DCF80-100				Standard				
				Volvo TAD760VE with Dana TE17000		Option Cummins QSB6,7 with Dana TE17000		
Drive train	Engine	Manufacturer – type designation		Volvo – TAD760VE (Turbo-Intercooler)		Cummins – QSB6,7 (Turbo-Intercooler)		
		Fuel – type of engine		Diesel – 4-stroke		Diesel – 4-stroke		
		Rating ISO 3046 – at revs		kW/rpm	180 – 2200		164 – 2200	
		Peak torque ISO 3046 – at revs		Nm-rpm	1100 – 1500		949 – 1500	
		Number of cylinders – displacement		cm ³	6 – 7150		6 – 6700	
		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		Powershift		Powershift		
		Numbers of gears, forward – reverse		3 – 3		3 – 3		
	Alternator	Type – power		W	AC – 1920		AC – 1680	
	Starting battery	Voltage – capacity		V – Ah	2×12 – 140		2×12 – 140	
Driving axle	Manufacturer – type		Kessler – Differential and hub reduction		Kessler – Differential and hub reduction			
Noise level	LpAZ (inside*) Sprit Delta		dB(A)	70		70		
	LwA (outside**)		dB(A)	–		–		

PERFORMANCE – VOLVO TAD760VE WITH DANA TE17000				DCF80-45	DCF90-45	DCF100-45	
Performance	Lifting speed	unloaded		m/s	0,65	0,65	0,65
		at 70% of rated load		m/s	0,45	0,45	0,45
	Lowering speed	unloaded		m/s	0,55	0,55	0,55
		at rated load		m/s	0,60	0,60	0,60
	Travelling speed, forward – reverse	unloaded		km/h	29 – 29	30 – 30	30 – 30
		at rated load		km/h	25 – 25	27 – 27	27 – 27
	Gradeability	Max.	unloaded	%	39	29	29
			at rated load	%	32	23	23
		At 2 km/h	unloaded	%	31	24	24
			at rated load	%	26	19	19
Drawbar pull	Max.		kN	144	127	127	

PERFORMANCE – CUMMINS QSB6,7 WITH DANA TE17000				DCF80-45	DCF90-45	DCF100-45	
Performance	Lifting speed	unloaded		m/s	0,65	0,65	0,65
		at 70% of rated load		m/s	0,45	0,45	0,45
	Lowering speed	unloaded		m/s	0,55	0,55	0,55
		at rated load		m/s	0,60	0,60	0,60
	Travelling speed, forward – reverse	unloaded		km/h	29 – 29	30 – 30	30 – 30
		at rated load		km/h	25 – 25	27 – 27	27 – 27
	Gradeability	Max.	unloaded	%	38	28	28
			at rated load	%	32	22	22
		At 2 km/h	unloaded	%	30	23	23
			at rated load	%	26	18	18
Drawbar pull	Max.		kN	140	122	122	

* Noise level according to EN12053

** Noise level according to 2000/14/EC

EXCELLENT OPERATOR COMFORT

To obtain the maximum out of your investment, you can never underestimate the importance of the drivers' working environment.

High productivity requires full driver concentration and efficiency to keep up handling speed, but also to avoid accidents causing injuries and costly damages. This is what ergonomics is all about. Comfort and awareness.

The F-generation cabin, the efficient Spirit Delta, offers excellent driver comfort with large display field on the instrument panel, generous glass surfaces that enable all-round visibility and low levels of noise and vibration.

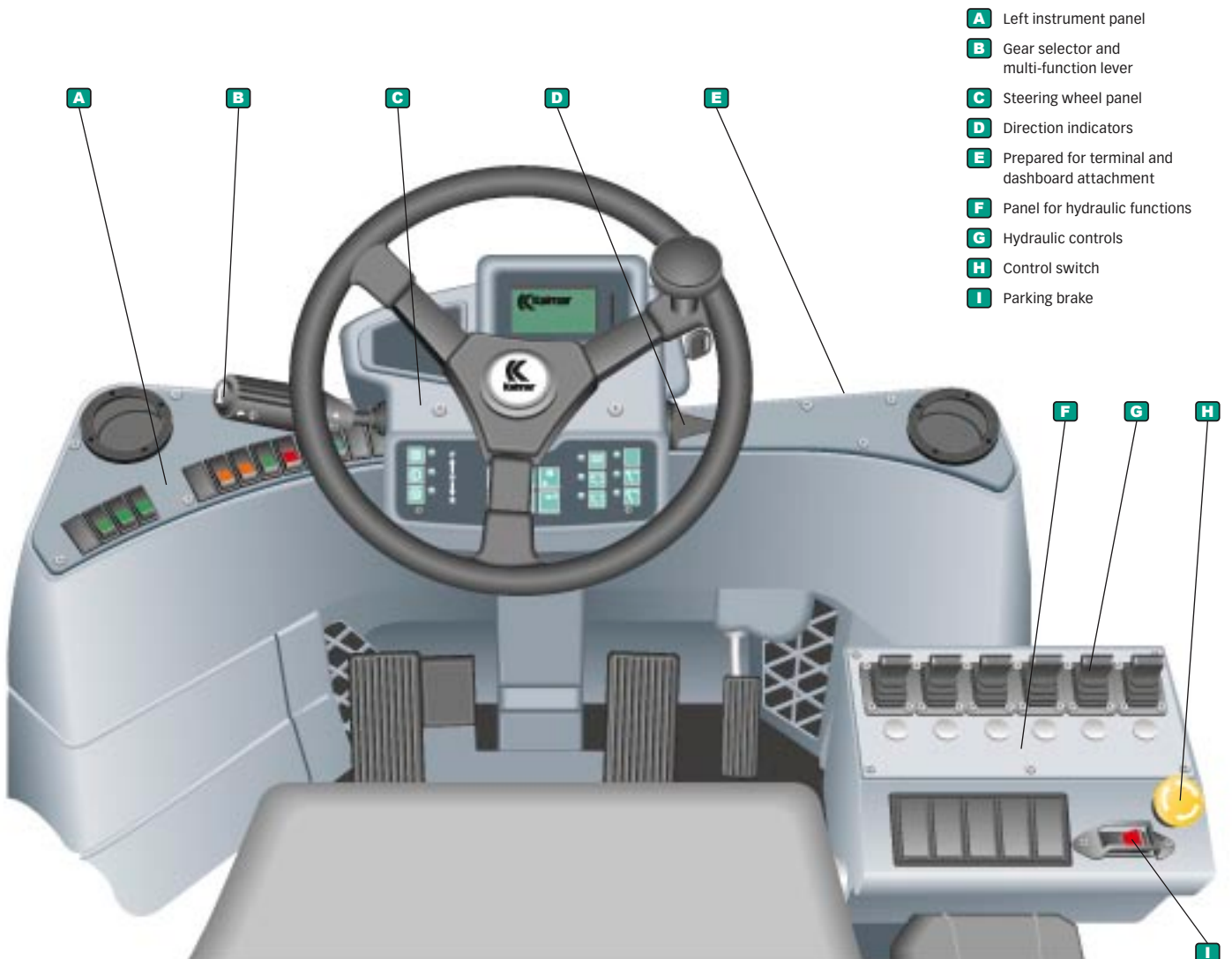
We focus on four important ergonomic areas:

- Operation
- Visibility
- Sound and vibrations
- Climate

The result is a cabin where everything is optimised to improve driver performance
Consider this:

- Individually adjustable controls (mini-levers as standard or joystick as option), steering wheel and seat.
- Intuitively positioned instruments.
- Switches and buttons with lights.
- Comfort pedals.

- Electronic accelerator.
- Central operation/warning display.
- Separately suspended and isolated cabin.
- Shock absorption to minimise vibrations.
- Maximum sound level inside is 70 dB (A).
- Generous interior dimensions and floor space.
- Optimised visibility – 360° all around.
- Electronically controlled heating/ventilation.
- Filters for fresh air and recirculation.
- High performance air conditioning system, optional.
- Pollen filter, optional.



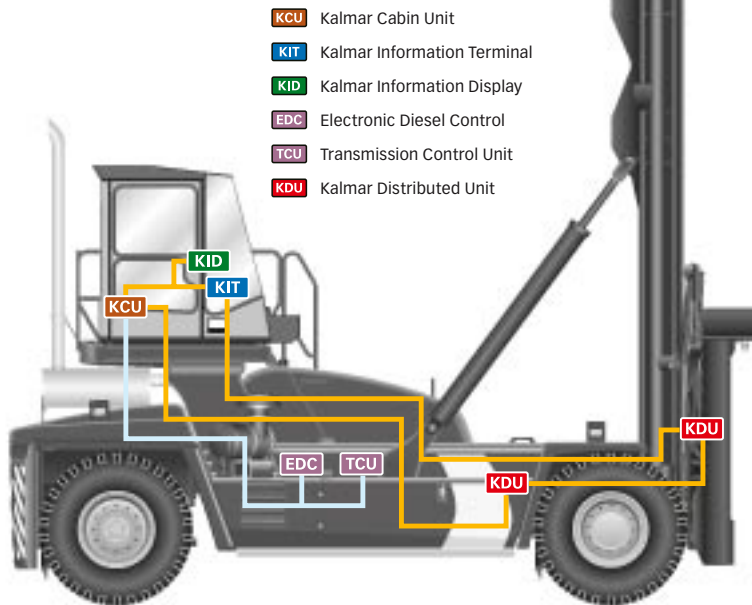
- A** Left instrument panel
- B** Gear selector and multi-function lever
- C** Steering wheel panel
- D** Direction indicators
- E** Prepared for terminal and dashboard attachment
- F** Panel for hydraulic functions
- G** Hydraulic controls
- H** Control switch
- I** Parking brake

THE SIMPLE WAY TO REACH NEW LEVELS OF UTILISATION

All vehicles today – cars, highway trucks, wheel-loaders, cranes etc – are designed with more and more sophisticated components and systems.

Each part interacts closely with the others and to reach the full potential requires computer assistance. This built-in intelligence is designed to support and leverage your handling operations, not confuse it.

The new Kalmar series possesses a well proven, thoroughly tested and optimised control system, which supports your driver, mechanics and financial controller. And it is simple to use.



The communication network layout.

A WELL-DISTRIBUTED CONTROL SYSTEM.

Two things are needed for a command initiated by the driver to result in a particular function, or for several functions to work together: power supply and communication. The power-feed supplies the machine's electrical or electro-hydraulic functions with voltage. The communication system controls and checks that the functions have been activated, waits in standby mode or indicates faults.

COMMUNICATION

The distributed power-feed and communication network consists of electrical components and a microcomputer-based system for controlling and monitoring the functions.

The most important components in the network are the control units (nodes).

They distribute control of the machine's functions. Each node has its own processor. The nodes integrate with each other and all communication; control signals and signal information are sent via data buses.

The nodes transmit their signals in messages on the network. Each message contains several signals and has its own address. Any units that need to know the status of a signal listen out for the address of the signal's message. All the nodes in the network listen to each other.

CAN-bus is a two-wire transfer of data and a definition of a bus type. CAN-bus technology has been chosen because it provides a reliable, robust transfer of data and is difficult to disrupt. CAN-bus loops have been used in Kalmar machines since 1995. The greatest benefit of using CAN-bus technology is that the amount of cabling can be reduced. All that is needed to establish communication are two data-bearing leads and two leads for feeding the nodes' processors. The network loop for both the CAN-bus and the nodes' processor feed are redundant.

The Kalmar Cabin Unit (KCU) is the control node for the entire network. There are several nodes, called KDUs (Kalmar Distribution Units), in the network. Each node is positioned near to the functions it is designed to deal with.

The Transmission Control Unit (TCU), which is the gearbox node, deals with the gearbox. The unit is connected in a separate CAN-bus loop with the EDC engine node (Engine Diesel Control) and KCU. The engine node controls the fuel injection and receives its control signals from its own transmitters on the engine.

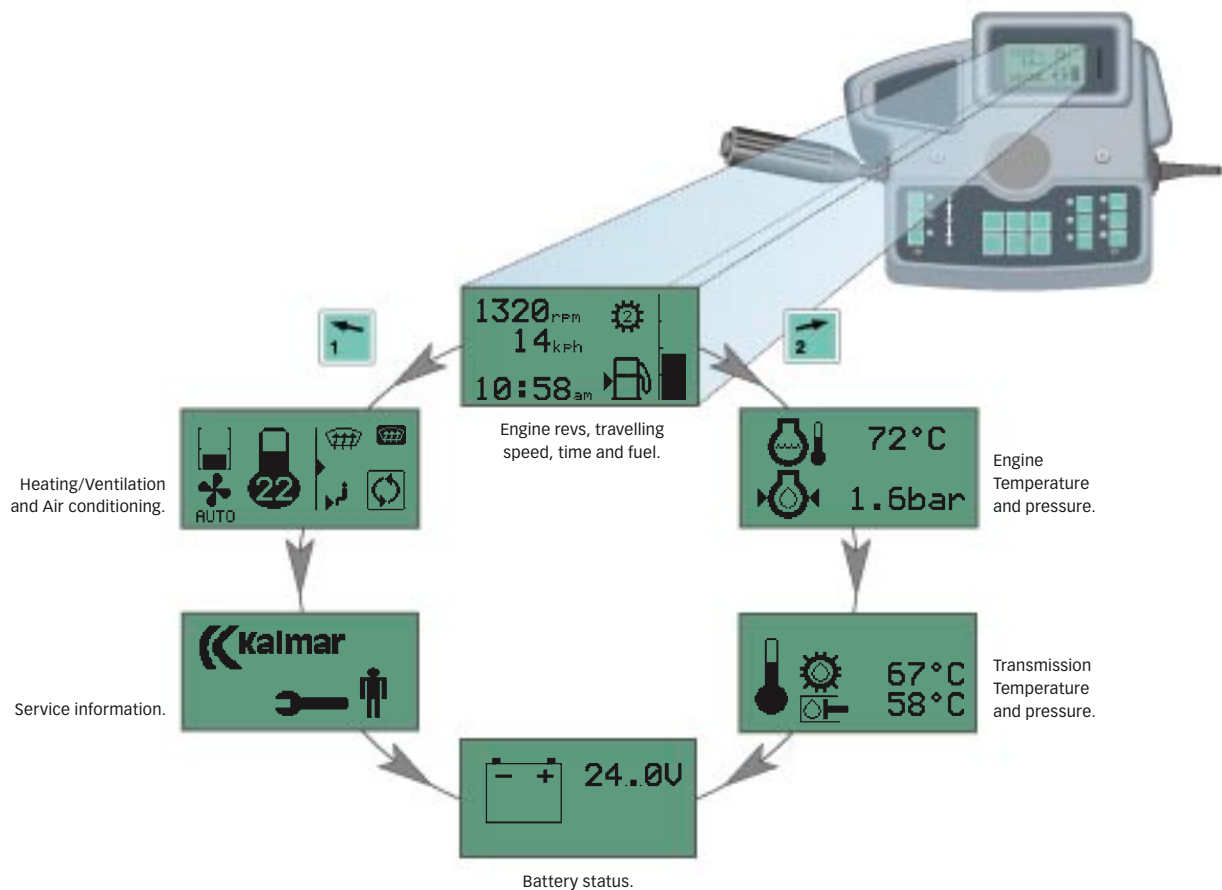
POWER SUPPLY

Power-feed for the functions differ from the feed required for communication and feeding of the nodes' processors. Each distribution unit (node) in the distributed network is fed voltage from one of the power distribution boxes. The distribution boxes are located inside the cabin and on one side of the frame. The distribution units (nodes) guide power from the distribution box to the required functions based on the instructions in the messages from the communication network.

**CONTROL FUNCTIONS
SUPPORT THE DRIVER.**

The driver and machine communicate very simply via the Kalmar Information Terminal (KIT) and the Information Display located right in front of the driver in the cabin. The two-way communication – from the driver to the machine and opposite – is handled by the KCU (Kalmar Cabin Unit) which is the control node for the entire network. Information to the driver comprises alarm warnings, operating details and action guided information. Messages, status, fault indications etc are presented on the Information Display (KID), while warnings and other monitoring indications are presented to the left.

Messages are only presented when they are relevant to the driver and the operation. The driver can focus on the job instead of checking meters and indicators.



SUPERIOR AVAILABILITY ENSURES YOUR INVESTMENT IS PROFITABLE

To understand the full potential of your investment requires being aware of the details, features and technical matters in a machine like the new Kalmar. But when it comes to availability it is critical that it operates constantly and is kept in good condition with an absolute minimum of maintenance and repairs.



FEWER STOPS FOR PLANNED MAINTENANCE.

The service intervals have been extended to 500 hours. The DCF is designed for fast daily inspection and preventive maintenance. All checkpoints are easy accessible and concentrated to specific locations.

Lubrication free components or central lubrication points have been utilised. The wet disc brake system is practically maintenance free. The indicator and monitoring support built into our control system make sure that the machine won't be misused or maintained incorrectly. The driver and mechanics will always get indications and guidance in time to avoid unnecessary and costly wear and tear or technical breakdowns. No unwanted stops.

A SAFE COMMUNICATION NETWORK.

The control and monitoring system, the redundant CAN-bus system is proven to be excellent in functionality and reliability. The network of control nodes allows for less wiring and connectors which reduces the number of sources of error.

The power-feed for each node and the transfer of control signals are independent of the other nodes, which means the risk of disruption becomes minimal. The redundant design means that there are always two paths to choose to maintain communication, which results in extra safety and reliability.

RELIABILITY BEGINS AT THE CONCEPT STAGE.

One of the guiding principles in designing the DCF was to minimise the number of potential sources of error. Therefore the machines consist of as few components and moving parts as possible. The functionality and operational reliability is assured by extensive testing.



All hydraulic hoses are fitted with ORFS-couplings.

THE HYDRAULIC SYSTEM IS CRITICAL.

No other part of the machine is working so hard under continuous pressure. To secure the reliability we have minimised the number of hydraulic components and couplings.

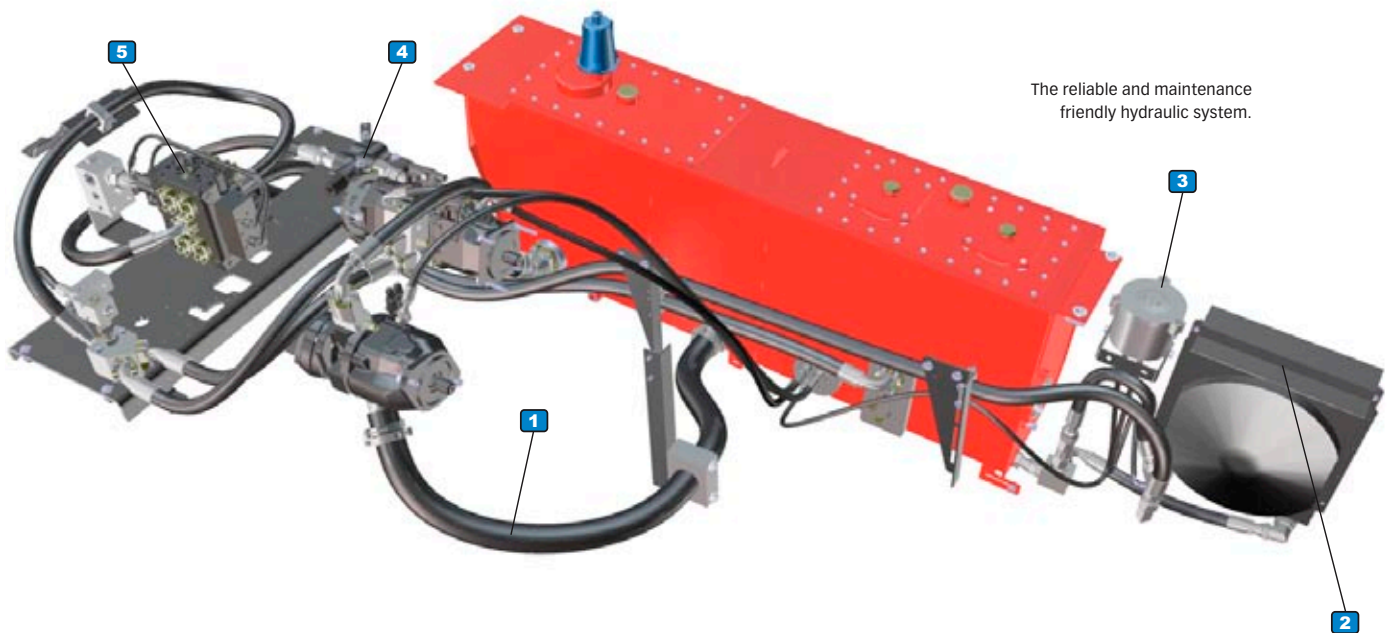
To ensure optimum oil pressure and security regardless of the handling operation the hydraulic system is based on three variable pumps – one for the brake system, cooling and filtering, one for working hydraulics and one supporting both steering and working hydraulics.

The distribution of pressure between working hydraulics and steering is done by the priority valve which ensures that the steering always receives enough pressure. The hydraulic oil pump for load handling is disconnected during forward driving, to use the engine power to best effect.

All three pumps interact together, using the same oil tank and filters, which are located inside the tank. The system is equipped with one oil cooler and a separate fan to

secure the right oil temperature, to match the hydraulic brake heat generation as well as feeding the overall system during tough handling cycles.

Oil supply and temperature control is handled through Kalmar's distributed control system. All indications are presented when appropriate on the Kalmar Information Display (KID) in the cabin.



OTHER IMPROVING FEATURES:

- 1** The large dimensions of hydraulic hoses improves the hose's lifetime (slower flow, less friction and less heating).
- 2** Thermostatic cooling improves the oil lifetime (temperature control, optimised working temperature).
- 3** High density filter improves the oil lifetime (clean oil).
- 4** ORFS – leak proof couplings all around improves reliability (minimises leakage).
- 5** All main hydraulic components at ground level are gathered on a separate plate, bolted to the chassis and therefore simple to remove.

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.



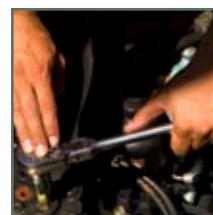
2 / GLOBAL NETWORK

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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