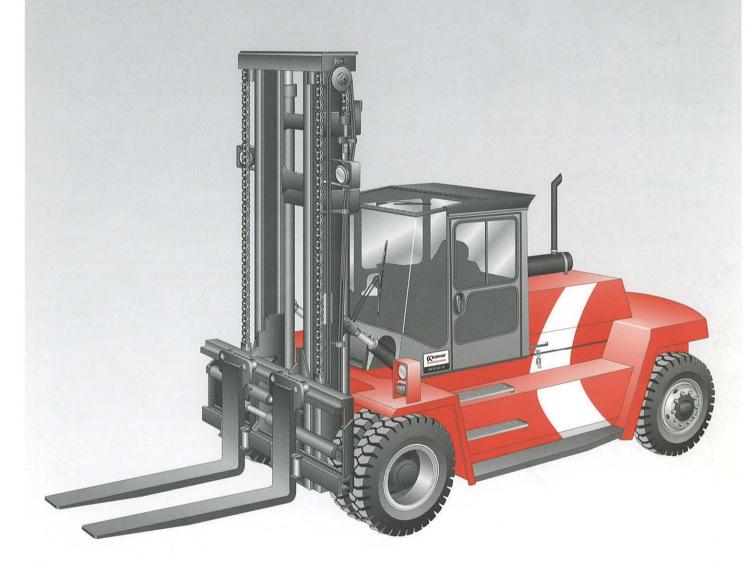
Technical Information Forklift trucks 9-18 tonnes

Kalmar DCD90-180, diesel











DCD90-180

The DCD90-180 with a lift capacity of 9-18 tonnes is the new generation of forklift trucks in the medium segment of Kalmar's comprehensive range of 4-90 ton trucks - a well proven range of trucks incorporating the latest design solutions for optimum productivity and overall economy.

A comprehensive range of optional equipment packages facilitates adaptation to special handling environments and different types of goods.

Type designation:

DCD100-12

Diesel engine -Counter-balance truck Generation Lift capacity, decitonnes Load centre, decimetre



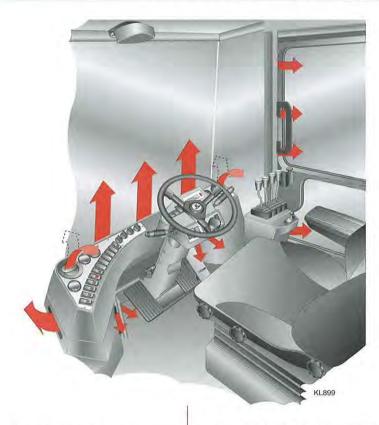
Operator Environment

The Spirit Delta cab is of a completely new and modern design that provides the operator with an efficient and safe place of work. The design of the cab is the result of a comprehensive analysis of operators' working conditions providing optimum visibility with large glass areas and no forward corner posts to inhibit the field of vision. The instrument panel is gently rounded and ergonomically designed with an uninhibited clear view of all essential information. Access to the cab is comfortable and secure thanks to the three steps up to the cab and many well located hand rails.

All cabs in the series can be tilted, for optimum service access. Noise and vibration levels are extremely low thanks to the insulated mounting to the chassis. The tilting cylinders operate against the cab which is isolated by means of rubber elements.

The operator's seat, steering wheel and hydraulic controls are all individually adjustable for optimum working position. Two easily operated, ergonomically positioned multi-function levers are provided for gear changing, windscreen wipers, washers and horn.

An extremely powerful heating/ventilation unit ensures a comfortable cab temperature. An easily replaced fresh air filter cleans the incoming air.



The unit slides out to give easy access for service. As standard, the equipment includes a powerful 3-speed fan for cooling, heating, defrosting and recirculation.

Optional Extras:

- Extra high cab, +200 mm Elevated cab, +300 mm
- Overhead guard
- Roof mounted grid protection
- Complete climate control system
- Partially/fully rotatable operator seat

Instrumentation

The instrument panel has logically grouped units, all within easy reach.

Standard instrumentation includes warning lamps for battery charging, low engine lubrication oil pressure, low brake pressure, high coolant temperature, high gearbox oil temperature and applied parking brake. In addition, gauges display values for engine coolant temperature, fuel quantity and operating time.

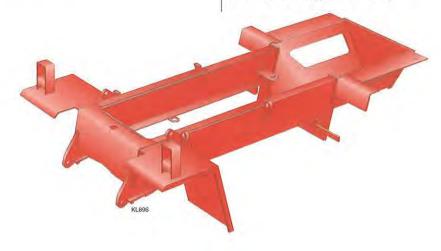
Trucks fitted with ECS monitoring are not normally equipped with warning lamps or gauges. These functions are handled by the ECS which has a single warning lamp and full text display showing current values and any faults that occur.

Chassis

The chassis is built of fully welded steel profiles which gives a rigid construction with extremely strong mounting points for the drive axle and lift equipment.

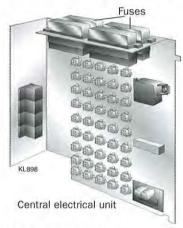
Stress concentrations have been eliminated for optimum tensile strength. The chassis is flexible and is used for a number of different drive line combinations. The space at the rear of the chassis is used for counter-weights, the number of which are adapted to the machine in question.

The chassis has an extremely low profile for good visibility. The tanks are separately constructed and bolted to the chassis in a position that also contributes to good visibility.



Electrical System

The electrical system is logically structured, easily serviced and completely coordinated with the other trucks in the Kalmar range. The system is supplied by two 12V batteries connected in series charged by an alternator, with related electronics for rectification and current stabilization. The system provides high power levels even at low engine revs. The electrical fuses, relays and connectors are located in an easily accessible position within a central electrical unit inside the cab, behind the operator's seat.



ECS (Optional) - Electronic Control System

Trucks can be equipped with ECS, a state of the art system for optimum operational security and overall economy. The systems consists of a number of modules that can be combined in different ways, depending on the nature of the operations. For example, the following functions are available:

- Automatic gear changing (Load sensing system)
- Lever steering
- Mini-steering
- Monitoring
- Electro-servo

See also separate information about the Kalmar ECS System.

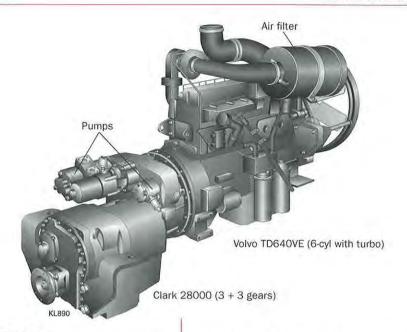
Engine

As standard, the DCD90-180 truck is equipped with Volvo's TD640VE diesel engine and as option the DCD90-136 with the Perkins 1006-60T1, both turbo-charged straight six diesel engines adapted to the specialized working requirements of a forklift truck, with high power and torque levels, even at low engine speeds. The engine has low exhaust emission levels and complies with today's stringent legal environmental demands (EU, CARB, EPA).

All engines are characterized by low fuel consumption and low noise and vibration levels.

Alternative engines:

- Perkins 1006-60T2
- Volvo TD730VE
- Volvo TWD731VE
- Scania DI9
- Cummins 6BTA 5.9-C200 See Alternative drive lines table



Transmission

All trucks in the series are equipped with Clark's well proven hydrodynamic transmission systems (3+3), with integrated gearbox and torque converter, for smooth, quick acceleration with a minimum of "clutch-slip".

A number of different transmissions systems are available, depending on the selected engine (see separate combination table). Constant mesh gears and gear changing by hydraulically applied clutches (Powershift) are, however, common to all gearboxes.

Gear changing is electrically achieved via solenoid valves, with three reverse and three forward gears, controlled by means of an easily operated multi-function lever.

Drive axle

The Kessler D81 drive axle is of an extremely robust design to be able to cope with tough working environments such as in the paper and pulp industries, saw mills, steel works, ports and terminals.

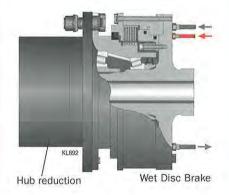
The axle has reduction in two stages differential and hub reduction - which ensures a minimum of strain on the transmission system. The drive axle is fitted with hydraulic braking system (see Service Brake System).

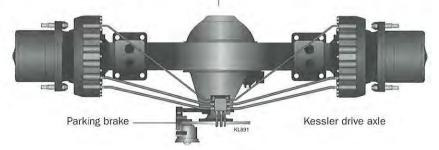
Parking Brake System

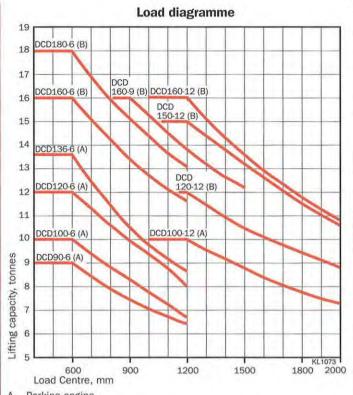
The parking brake system consists of a dry disc brake on the in-going shaft of the drive axle. The disc brake is applied by means of a powerful spring in the parking brake cylinder and is released by means of hydraulic pressure from the parking brake valve in the cab.

Service Brake System

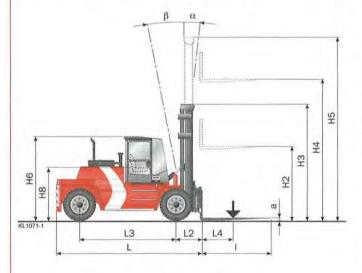
The service brake system is of the Wet Disc Brake type, a system with oilcooled discs that are alternately fixed to and rotating with the hub. When the brakes are applied, the discs are pressed together by hydraulic pressure from the brake pedal, which provides extremely effective braking. The system is virtually maintenance free and can cope with heavy loads over an extended period of time, with no fade and without the need for brake adjustments. The heat generated during braking is dissipated via a cooling circuit in which the truck's total volume of hydraulic fluid comes into play. A special filter protects the braking system from any impurities.

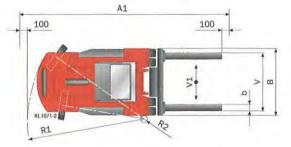


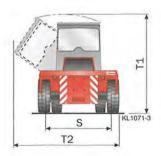




Perkins engine
Volvo engine
DCD90-6 to DCD180-6 models:
Full lifting capacity up to 5000 mm lift height with Duplex/Duplex freelift/Triplex masts and integrated sideshift/fork positioning carriage.







	A = Perkins engine B = Volve	oad centre distance, decimetre o engine							
	2 Lifting capacity	Rated		kg					
Lifting data		At max lifting height		kg					
00	3 Lifting speed	Unloaded		m/s					
		At rated load		m/s					
Ē	4 Lowering speed	Unloaded		m/s					
		At rated load		m/s					
	5 Driving speed forward/	Unloaded		km/h					
o o	reverse	At rated load		km/h					
Реготтапсе	6 Gradient capability	Max, unloaded		%					
E		Max at rated load		%					
ō		At 2 km/h, unloaded		%					
Pe		At 2 km/h, at rated load		%					
	7 Draw bar pull	Max		kN					
	8 Stability ISO 1074/10525	Yes/No							
Weight	9 Service weight			-					
	10 Axle load front	Unloaded							
leis eis		At rated load		-					
>	11 Axle load back	Unloaded		kg					
		At rated load		kg kg kg					
	12 Engine	A. Perkins B. Volvo							
		Manufacturer - type designation							
		Fuel - type of engine							
		Rating ISO 3046 - at revs	kW/I	np - rpm					
Drive system		Peak torque ISO 3046 - at revs	Nm -	rpm					
		No of cylinders - displacement		cm ³					
Ste		Fuel consumption, normal operatio	n	I/h					
Sy	13 Alternator	Type - power		W					
Ive	14 Starting battery	Voltage - capacity		V - Ah					
ā	15 Gearbox	C. Clark 20000 D. Clark 28000		kg k					
		Manufacturer - type designation							
		Clutch, type							
		Gearbox, type							
		No. of gears forward - reverse							
	16 Drive axle	Type							
-	17 Wheels/tyres								
.6		Type front and rear							
Ke									
bra		No. of wheels, front - rear (*driven)							
sels, bral steering		Inflation pressure MPa							
Wheels, brakes, steering	18 Steering system	Type - maneuvering							
\$	19 Service brake system	Type - affected wheels							
	20 Parking brake system	Type - affected wheels							
	21 Hydraulic pressure	Max		MPa					
ö	The first of the control of the cont	Equivalent noise level in cab (Lm)		dB(A)					
Misc.	23 Fuel volume	- Territoria de la constitución		L					
-	24 Hydraulic fluid volume		_	L					
	25 Minimum aisle width for 9	0° stacking with forks	A1	mm					
	26 Truck	Truck length without forks	L	mm					
	22	Truck width	В	mm					
		Height, basic machine	H6	mm					
		Seat height	H8	mm					
		Distance between centre of front	L2	mm					
		axle - front face of fork arm	-						
		Wheelbase	L3	mm					
		Load centre	L4	mm					
		Track (c-c) front - rear	S	mm					
		Turning radius, outer	R1	mm					
		Turning radius, inner	R2	mm					
us				mm					
sions		Ground clearance, min	1	mm					
ensions		Ground clearance, min Max height when tilting cab	T1	-					
Jimensions	,		T1 T2	mm					
Dimensions	27 Standard duplex mast	Max height when tilting cab	_	mm					
Dimensions	27 Standard duplex mast	Max height when tilting cab Max width, tilted cab	T2	_					
Dimensions	27 Standard duplex mast	Max height when tilting cab Max width, tilted cab Lifting height Mast height, min.	T2 H4	mm					
Dimensions	27 Standard duplex mast	Max height when tilting cab Max width, tilted cab Lifting height Mast height, min. Mast height, max.	T2 H4 H3	mm mm					
Dimensions	27 Standard duplex mast	Max height when tilting cab Max width, tilted cab Lifting height Mast height, min. Mast height, max. Mast tilting, forwards - backwards	T2 H4 H3 H5	mm mm					
Dimensions		Max height when tilting cab Max width, tilted cab Lifting height Mast height, min. Mast height, max. Mast tilting, forwards - backwards Ground clearance, min	T2 H4 H3 H5 α-β	mm mm o mm					
Dimensions	27 Standard duplex mast 28 Forks	Max height when tilting cab Max width, tilted cab Lifting height Mast height, min. Mast height, max. Mast tilting, forwards - backwards Ground clearance, min Width	T2 H4 H3 H5 α-β	mm mm o mm o mm					
Dimensions		Max height when tilting cab Max width, tilted cab Lifting height Mast height, min. Mast height, max. Mast tilting, forwards - backwards Ground clearance, min Width Thickness	T2 H4 H3 H5 α-β	mm mm o mm					
Dimensions		Max height when tilting cab Max width, tilted cab Lifting height Mast height, min. Mast height, max. Mast tilting, forwards - backwards Ground clearance, min Width Thickness Length of fork arms	T2 H4 H3 H5 α-β b	mm mm mm o mm mm mm					
Dimensions		Max height when tilting cab Max width, tilted cab Lifting height Mast height, min. Mast height, max. Mast tilting, forwards - backwards Ground clearance, min Width Thickness	T2 H4 H3 H5 α-β b a	mm mm mm o mm mm mm					

This table relates to trucks fitted with standard equipment, for optional equipment, see separate tables.

¹⁾ More powerful engines are available, up to 167 kW/230 hp 2) Stronger gearboxes are available, Clark 32000 (3+3)

³⁾ Semi-solid tyres are available for all models (Super-Elastic)

DCD											15 TON				
90-6 A	90-6 B	DCD 100-6 A	DCD 100-6 B	DCD 100-12 A	DCD 100-12 B	DCD 120-6 A	DCD 120-6 B	DCD 120-12 B	DCD 136-6 A	DCD 136-6 B	DCD 150-12 B	DCD 160-6 B	DCD 160-9 B	DCD 160-12 B	180-6 B
	000			000			12000			600	15000		16000		1800
	000		100	000			12000			600	15000		16000		1800
0.40	0.50	0.40	0.50	0.40	0.50	0.35		.40	0.35	0.40	0.40		0.40		0.40
0.35	0.45	0.35	0.45	0.35	0.45	0.30	0.	.35	0.30	0.35	0.35		0.35		0.35
	.40			40			0.40			.40	0.40		0.40		0.40
	.40			40			0.40	3		.40	0.40		0.40		0.40
30	30	30	30	30	30	30		30	30	30	30		30		30
28	30	28	30	28	30	28	30		28	30	30		30		30
65	133	61	117	40	65	53	95	61	50	85	54	63	57	51	55
34	54	31	49	24	37	26	41	33	23	36	28	29	28	26	26
45	89	42	82	30	51	37	71	49	36	65	44	50	46	41	44
24	43	22	39	18	30	19	33	27	18	29	23	24	23	22	21
77	111	77	111	73	105	75	109	105	73	105	105		105		105
								Yes							
	800	145			900		600	19700		000	21400	19200	20600	22400	2110
7200 21100			300		300	7900		10100		900	9400	10000	9600	10500	9800
		22800		27000		25900		29600	27800		33800	33200	34200	35800	3660
	600		700	80	500		700	9600		100	12000	9200	11000	11900	1130
1	700	17	700	19	900	1	700	2100	1	800	2600	2000	2400	2600	250
Α.	B.	Α.	В.	Α.	В.	Α.	B.	В.	A.	В.	B.	В.	В.	В.	В.
		A. Pe	rkins - 100	06-60T1 (T	urbo)					В.	Volvo - TD	640VE (Tur	bo) 1)		
				4-stroke	- C							- 4-stroke			
				6 - 2300								75 - 2400			
				1400								400-1500			
			6-5									5480			
				- 7				_				-10			
			101	1260					_	_		- 1540			
				- 140				_		_		2 - 140	_		_
0	T D	0		C.	D.	C.	D.	D.	C.	D.	D.	D.	D.	D.	D.
C.	D.	C.	D.			U.	D.	D,	Q.					D.	D.
		C.		07 FT 203	02). Clark - 13		00 4		
				converter								converter			
		Ну		ic Powersh	ift						Hydro-dyna		shift		
		2.192		- 3	00-000							3-3			
		Diffe	erential and	d hub redu	ction					Di	fferential ar	nd hub red	uction		
							Pnei	umatic 3)			000				2
	10.00×2	20/16PR		12.00×2	20/20PR	11.00×	20/16PR	umatic 3)		12	2.00×20/20	OPR			
	10.00×2	20/16PR		12.00×2	20/20PR	11.00×	20/16PR			12	2.00×20/20	OPR			
						11.00×	20/16PR	umatic 3) 1* - 2							20PR
C	10.00×2	20/16PR 0.	.8		20/20PR		20/16PR 4 0.9	1*-2		12	0.9		1.9	1.0	20PR
C			.8		.9	Hyd	20/16PR 0.9 raulic-serv	1* - 2 ro - Steering	Wheel).9			1.9	1.0	20PR
0			.8		.9 Oil co	Hyd ooled disc	20/16PR 0.9 raulic-serv brakes (W	1* - 2 o - Steering /et disc bral	Wheel kes) - drive	0.9 wheels			1.9	1.0	20PR
	0.7	0.		0	.9 Oil c	Hyd ooled disc Dry, spring	0.9 raulic-serv brakes (W	4* - 2 ro - Steering /et disc brak disc brake	Wheel (es) - drive - drive whe	0.9 wheels	0.9			1.0	20PR
10	6.0	0.	7.5	19	.9 Oil c	Hyd ooled disc Dry, spring	0.9 raulic-serv brakes (W activated 7.5	1* - 2 ro - Steering /et disc bral disc brake 15.0	Wheel (es) - drive - drive who 1).9 wheels eels 8.5	0.9		17.5	1,0	20PR 1.0
	0.7	0.		19	.9 Oil co 0.5 73	Hyd ooled disc Dry, spring	0.9 draulic-serv brakes (W activated 7.5	4* - 2 ro - Steering /et disc brak disc brake	Wheel (es) - drive - drive who 1 70	o.9 wheels eels 8.5 73	0.9 16.5 73		17.5 73	1.0	1.0 1.0 19.0 73
70	6.0 73	0. 17 70	7.5 73 05	19 70 2	.9 Oil co	Hyd ooled disc Dry, spring 1	0.9 draulic-serv brakes (W activated 7.5	1* - 2 ro - Steering /et disc brak disc brake 15.0	Wheel (es) - drive - drive who 1 70	0.9 wheels eels 8.5 73	0.9 16.5 73 205		17.5 73 205	1,0	19.0 19.0 73 209
70	6.0 73 145 180	0. 17 70 20	7.5 73 05	19 70 2 2	.9 Oil co	Hyd ooled disc Dry, spring 1 70	0.9 Iraulic-serv brakes (W activated 7.5 205	t* - 2 o - Steering let disc brake disc brake 15.0 73	Wheel (es) - drive - drive who 1 70	0.9 wheels eels 8.5 73 205 220	0.9 16.5 73 205 220	0	17.5 73 205 220		1.0 19.0 73 209 220
70 10 10 10 10	6.0 73 745 180 240	17 70 20 13	7.5 73 05 80 70	19 70 2 2 79	.9 Oil co 0.5 73 05 20 45	Hyd ooled disc Dry, spring 70	0.9 Iraulic-serv brakes (W activated 7.5 205	1* - 2 70 - Steering /et disc brald disc brake	Wheel (es) - drive - drive who 1 70	0.9 wheels eels 8.5 73 205 220 665	0.9 16.5 73 205 220 8380	7160	17.5 73 205 220 7770	8770	1.0 19.0 73 205 220 6745
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70 1 1 62 44	6.0 73 745 180 240	17 70 20 13	7.5 73 05 80 70 20	19 70 2 2 79 50 25	0.5 73 05 20 45 65	Hydooled disc Dry, spring 1770 164 47	20/16PR 0.9 raulic-serv brakes (W activated 7.5 205 80 475 725 480	73 - 220 - 8370 - 5315 - 2530	Wheel (es) - drive drive who 1 70 66 49	20.9 wheels els 8.5 73 205 220 365 985 530	16.5 73 205 220 8380 5375 2530	7160	17.5 73 205 220 7770 5315 2530	8770	19.0 19.0 73 200 220 674 511 260
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10 70 1 1 62 44 24 28	6.0 73 145 180 240 470 465	177 70 20 11: 64 47. 24:	7.5 73 05 80 70 20 65 80	70 70 2 2 79 50 25 29	0.5 73 05 20 45 65	Hydoooled disc Dry, spring 170 1. 64 47 24	20/16PR 0.9 raulic-serv brakes (W activated 7.5 205 80 475 725 480	73 - 220 - 8370 - 5315 - 2530	Wheel (es) - drive drive who 1 70 66 49	20.9 wheels els 8.5 73 205 220 365 985 530	16.5 73 205 220 8380 5375 2530	7160	17.5 73 205 220 7770 5315 2530	8770	19.0 19.0 73 20: 22: 674: 511: 2600 291: 1766
10 70 1 1 62 44 24 28	6.0 73 145 180 240 470 465 880	177 70 21 11 64 477 224 28 177	7.5 73 05 80 70 20 65 80	70 2 2 2 79 50 25 29	.9 Oil c	Hydooled discooled discool	20/16PR 0.9 raulic-serv brakes (W. activated 7.5 205 80 175 725 180 390	14* - 2 o - Steering /et disc brake 15.0 73 220 8370 5315 2530 2910	Wheel (es) - drive (es) - drive who for the property of the pr	0.9 wheels els 8.5 73 205 220 665 985 530 910	16.5 73 205 220 8380 5375 2530 2910	7160	17.5 73 205 220 7770 5315 2530 2910	8770	19.0 19.0 73 205 226 6744 5111 2600 2910
10 70 11 14 62 44 24 28 11	6.0 73 145 180 240 470 465 880 760 890	177 70 20 11 64 47 24 28 17 8	7.5 73 05 80 70 20 65 80 60 90	70 2 2 79 50 25 29 17	0.5 73 05 20 45 65 30 10 99 85	Hydooled discoor, spring 17 70 1. 64 47 2.8 1.7 8	20/16PR 0.9 raulic-serv brakes (W a activated 7.5 205 80 175 725 180 390 770	1*-2 o - Steering /et disc braid disc brake 15.0 73 220 8370 5315 2530 2910 1790 985	Wheel (es) - drive - drive who 1 70 66 49 22 1	20.9 wheels eels 8.5 73 205 220 665 985 530 910 790 905	0.9 16.5 73 205 220 8380 5375 2530 2910 1790 995	7160 5305	17.5 73 205 220 7770 5315 2530 2910 1790 985	8770 5575	19.0 19.0 73 20.9 22.0 674! 511: 2600 291: 1766 98:
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Steering System

The steering system is completely hydraulic and is fed from hydraulic pump 1 (see the hydraulic system diagram), via a priority valve. When the steering wheel is turned, the steering valve transmits a load signal to the priority valve which ensures that the steering system always has sufficient hydraulic pressure.

The steering axle is an extremely robust construction with double-action cylinder.

The pendulum suspension of the axle over powerful, spherical rubber bearings has a long operative lifespan and provides good shock-absorption. The minimal number of parts ensures operational reliability, a minimum of service points and easy maintenance. The steering geometry allows large wheel displacement and thereby, a tight turning circle.

Hydraulic System

The hydraulic system includes the following sub-systems:

- · Working hydraulics
- · Service brake system with braking circuit and cooling circuit
- · Parking brake system
- · Hydraulic servo (standard)
- · Steering system

In standard form, the hydraulic system is built around two gear wheel type pumps - one double and one single. The pumps are driven from the outlet of the torque converter. The flow from the pumps is fed to a valve block with a large number of in-built functions (see diagram). The valve block enables easy installation with a minimum number of hydraulic lines/hoses.

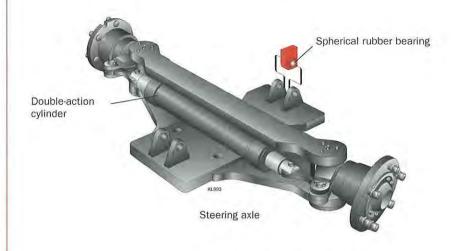
The outer section of the double pump feeds the lift and tilt functions, whilst the inner section feeds other working hydraulic functions. With full extension of the lift function, both sections of the double pump operate to provide maximum lift capacity.

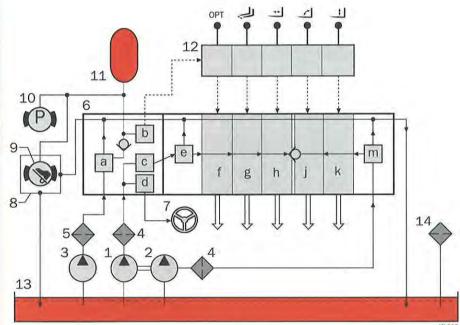
The separate single pump feeds the hydraulic accumulator, which in turn, supplies the brake and servo systems. As a safety measure, the accumulator ensures sufficient brake pressure to be able to brake several times, should the engine temporarily stop.

The excess flow from the pumps is led to the brake cooling circuit to dissipate the heat generated during braking, before being returned to the hydraulic tank.

Optional extras:

- · Load sensing variable pumps
- · Electro-servo controls
- Piston type accumulator
- · Additional hydraulic functions
- Hydraulic joystick





Hydraulic system for truck with Volvo engine

- Hydraulic pump, working hydraulics, steering system
 Hydraulic pump, lift/tilt
 Hydraulic pump, accumulator charging
 High pressure filter
 High pressure filter
 Main value with double valve block

- High pressure filter
 Main valve with double valve block
 a. Accumulator charge valve
 With fully charged accumulator feed to
 brake cooling circuit or return to tank
 b. Feed, servo system
 c. Priority valve, steering system
 d. Feed, steering system
 e. Main pressure limitation valve
 f. Control valve, LEVELLING
 g. Control valve, FORK POSITIONING
 h. Control valve, SIDE-SHIFT
 j. Control valve, TILT
 k. Control valve, LIFT
 m. Main pressure limitation valve

 - Main pressure limitation valve

- Steering system Cooling circuit for service brake system Brake circuit, service brake system Parking brake system

- Accumulator Servo assisted control levers
- 13. Hydraulic tank 14. Breather filter, hydraulic tank

Trucks with Perkins engines are equipped with a simpler hydraulic system with only one double pump. One section of the pump feeds the working hydraulics whilst the other section feeds the steering system and charges the accumulator. The main valve is fitted with a valve block, input section and main pressure limitation valve.

Lift mast

Lift Masts

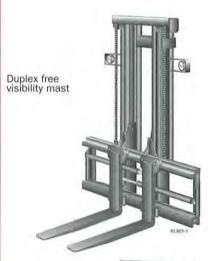
All masts, both duplex and triplex, are constructed on the "free visibility principle" and can be supplied with the area steered free-lift system which, in terms of function, is extremely reliable and secure.

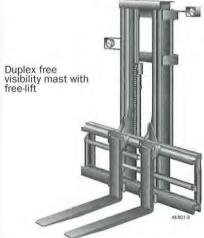
The robust mast profiles are of high tensile steel, dimensioned for minimal obstruction of the field of vision and long service life. The lift cylinders are positioned in the "dead" angles of the mast. All mast wheels are hardened and fitted with high quality bearings.

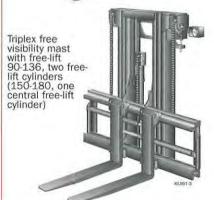
As standard, trucks are fitted with the duplex free visibility mast.

Optional extras:

- Duplex free visibility mast with free-lift
- Triplex free visibility mast with free-lift







Fork Carriages

A number of different models of fork carriages are available, all of them with excellent through-vision. The standard model has manually moveable forks. However, the majority of trucks are supplied with hydraulic side-shift and fork positioning.

Lift

Lift

Lift mast

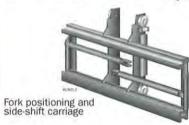
Free

Optional extras:

- · Fork positioning/side-shift
- Fork positioning/side-shift with levelling
- Fork positioning/side-shift with centre levelling
- · Side-shift carriage
- · Fork shaft system
- Additional types of clamp attachments
- · Coil rams for steel handling







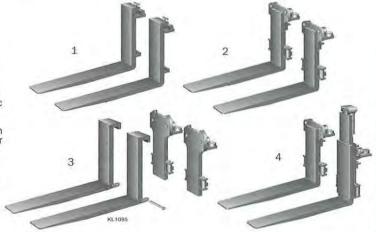
Forks

The forks are one-piece forged in high tensile steel. The standard fitting is over hooks on the fork carriage, whilst hydraulically controlled forks are fitted over rollers running on bearings - four upper rollers and two lower support for each fork.

For ease of changing between forks and other attachments, a fork shaft system is available, where the forks are mounted on a separate fork holder.

- height height lift lift height Min Max Min Max HA H2 H2 1) H3 1) H5 H3 H5 mm mm mm mm mm mm 90-6-136-6 100-12-180-6 Duple: 3000 4500 3185 4685 free visi-bility 3250 3125 4750 3310 4935 3250 5000 3435 5185 3750 3375 5250 3560 5435 4000 3500 5500 3685 5685 4250 3625 5750 3810 5935 4500 3750 6000 3935 6185 4750 3875 6250 4060 6435 5000 4000 6500 4185 6685 5250 4125 6750 4310 6935 5500 4250 7000 4435 7185 5750 4375 7250 4560 7435 6000 4500 7500 4685 7685 6250 4625 7750 4810 7935 4750 6500 8000 4935 8185 6750 4875 8250 5060 8435 7000 5000 8500 5185 8685 3000 3000 4500 1500 3175 4675 1500 3250 3125 4750 162 3300 4925 1625 visi-3500 3250 5000 1750 3425 5175 1750 bility, free lift 3750 3375 5250 1875 3550 5425 1875 4000 3500 5500 2000 3675 5675 2000 3625 2125 4250 5750 3800 5925 2125 4500 3750 6000 2250 3925 6175 2250 4750 3875 6250 2375 4060 6425 2375 5000 4000 6500 2500 4175 6675 2500 5250 4125 6750 2625 4300 6925 2625 4250 4425 7175 2750 5500 7000 2750 5750 4375 7250 4550 7425 2875 2875 4500 7500 3000 4675 7675 3000 6000 6250 4625 7750 3125 4800 7925 3125 4925 8175 6500 4750 8000 3250 3250 6750 4875 8250 3375 5050 8425 3375 7000 5000 8500 3500 5175 8675 3500 Triplex 4500 2940 5940 1500 3120 6180 1500 4750 3025 6190 1580 3205 6435 1580 3110 6440 1665 5000 3285 6685 1669 5250 3195 6690 1750 3370 6930 1750 5500 3280 6940 1830 3450 7180 1830 5750 3360 7190 1915 3535 7435 1915 6000 3445 7440 2000 3615 7685 2000 3530 7690 2080 3700 7940 2080 6250 3615 7940 2165 3780 8180 2165 6500 6750 3700 8190 2250 3865 8435 2250 7000 3780 8440 2340 3945 8685 2340
- 1) These figures are based on the 120-6 and vary with tyre dimensions. H3 and H5 alter 10 mm for 90-100-6 +20 mm for 136-6

- Standard forks for manual manoeuvring
- 2. Forks with roller fittings for hydraulic manoeuvring
- Fork shaft system with separate holder for each fork
- 4. Forks with hydraulic levelling



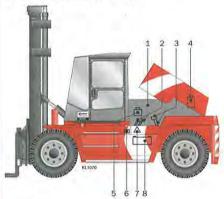
Routine daily service checks contribute to a safer work place and reduce the risk of break-downs.

Daily service checks are made easier thanks to well thought out and grouped service points. The operator can reach all service points without having to climb up onto the truck.

The cab can be tilted by means of a hydraulic cylinder operated by a manual pump. When the cab has been tilted, the gearbox, hydraulic pumps, hydraulic fluid filter, parking brake, main valves, control valves, etc., are readily accessible for service.

The engine hood is divided into three sections - a fixed middle section that bears the silencer and hinged outer sections to each side.

Indicator for air filter Gearbox oil, dip-stick and filler cap Engine oil, dip-stick and filler cap Coolant Screen wash liquid Fuel, filler cap Main switch, electrical system Batteries 2x12 V - 140 Ah





Truck with overhead guard.

HAVEN 330 HEIZEGEMWEG 7

2030 ANTWERPEN - 3 BELGIUM

Standard equipment

The standard specification of our trucks includes important and vital components that contribute to the efficiency and safety of the truck.

Robust truck chassis 9-18 ton

Spirit Delta operator environment with low noise level

Tiltable cab insulated against vibration

Powerful ventilation unit with efficient filter

Roof window of lexan

Sliding window on the left hand side

Wash/wipers, front, rear and roof

Lockable cab doors

Wide bottom access step and two extra steps on both sides Adjustable, shock absorbing, ergo-

nomic operator seat with safety belt Three-way adjustable steering console

Two-way adjustable hydraulic lever console

Arm support on right hand side Environment friendly powerful engines

Fully dimensioned radiator for engine and oil cooler for gearbox

Powerful gearboxes with powershift Drive axle with oil cooled disc brakes

Free visibility lift equipment

Steering axlé with double-action cyl-

Hydraulic system with finger tip control Simple, reliable electrical system

Comprehensive and logically

grouped instrumentation Accelerator, brake pedal and forward-

reverse selector Lighting: Working lights, indicators, brake, reversing and positional lights

Large service hatches and tiltable cab for daily inspections

Towing pin (manual)

Complete documentation

Safety

All Kalmar trucks are CE-marked and are constructed to and comply with the following norms:

EN1551

 ASME B56.1 (USA, trucks up to 13.6 tonnes)

• EN12895 (EMC test, Europe)

Optional equipment

A wide range of optional equipment and packages are available for our trucks, to satisfy further specialization and provide added efficiency

Alternative engines and gearboxes

· Load sensing hydraulic system

· Exterior and interior cab equipment, such as air conditioning, etc.

· Lighting, mirrors and protective grid

· Different types of lift equipment, attachments, exhaust controls, air filters, etc.

ECS with different types of module

· Catalytic converter and particle filter

Summary

Kalmar's medium trucks are of a well proven design, manufactured in large volumes for demanding environments such as:

· Timber, paper and pulp industries

Steel works and foundries

Concrete industry

· Ports and terminals

Other heavy industries

A well planned and protected operator environment makes Kalmar's trucks efficient and comfortable working implements.

Readily accessible service points for ease of maintenance.

Alternative drive I ■ = Standard O = Optio	9-06	100-6	100-12	120-6	136-6	120-12	150-12	160-6	160-9	160-12	180-6	
Engine *Turbo					111	1.				.,		
Volvo TD640VE*	129 kW/690 Nm											0
Perkins 1006-60T1*	85 kW/465 Nm	0	0	0	0	0				1		
Volvo TD730VE*	150 kW/800 Nm		0	0	0	0	0	0	0	0	0	0
Volvo TWD731VE**	167 kW/893 Nm		0	0	0	0	0	0	0	0	0	0
Perkins 1006-60T2*	114 kW/620 Nm	0	0	0	0	0	0	0	0	0	0	0
Scania DI9**	167 kW/930 Nm			0		0	0	0	0	0	0	0
Cummins 6BTA5.9-C200**	162 kW/814 Nm	0	0	0	0	0	0	0	0	0	0	0
Gearbox with powershift, 3+3 gears						1						
Clark 13.7HR 28000 (Volvo TD640VE, TD730V Perkins 1006-60T2, Cumi		•	•	•			•	•	•	•	•	•
Clark 1207 FT 20302 (Perkins 1006-60T1)				0	0	0						
Clark 13.7HR 32000 (Volvo TD640VE, TD730VE, Volvo TWD731VE, Scania DI9, Cummins 6BTA)			0	0	0	0	0	0	0	0	0	0
Drive axle with Wet Disc Brakes												0
Pneumatic tyres 1 1 1		•			•							
Optional: Semi-solid tyres (Super-Elastic)			10	0	0	0	10	0	0	0	0	0





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