Kawasaki

Hydraulic Components and Systems for Industrial Vehicles

Kawasaki Precision Machinery

Power and Control from Kawasaki.

Kawasaki's Hydraulic Components and Systems are utilized world-wide to provide the power source in Excavators, Cranes, Fork Lifts, Agricultural Machinery and many other Special Purpose Vehicles.

Kawasaki has an enviable reputation for producing high quality hydraulic components for high power applications requiring precise control. Designed for operation in the most rigorous of operating conditions Kawasaki's Hydraulic components are market leaders in reliability and controllability.

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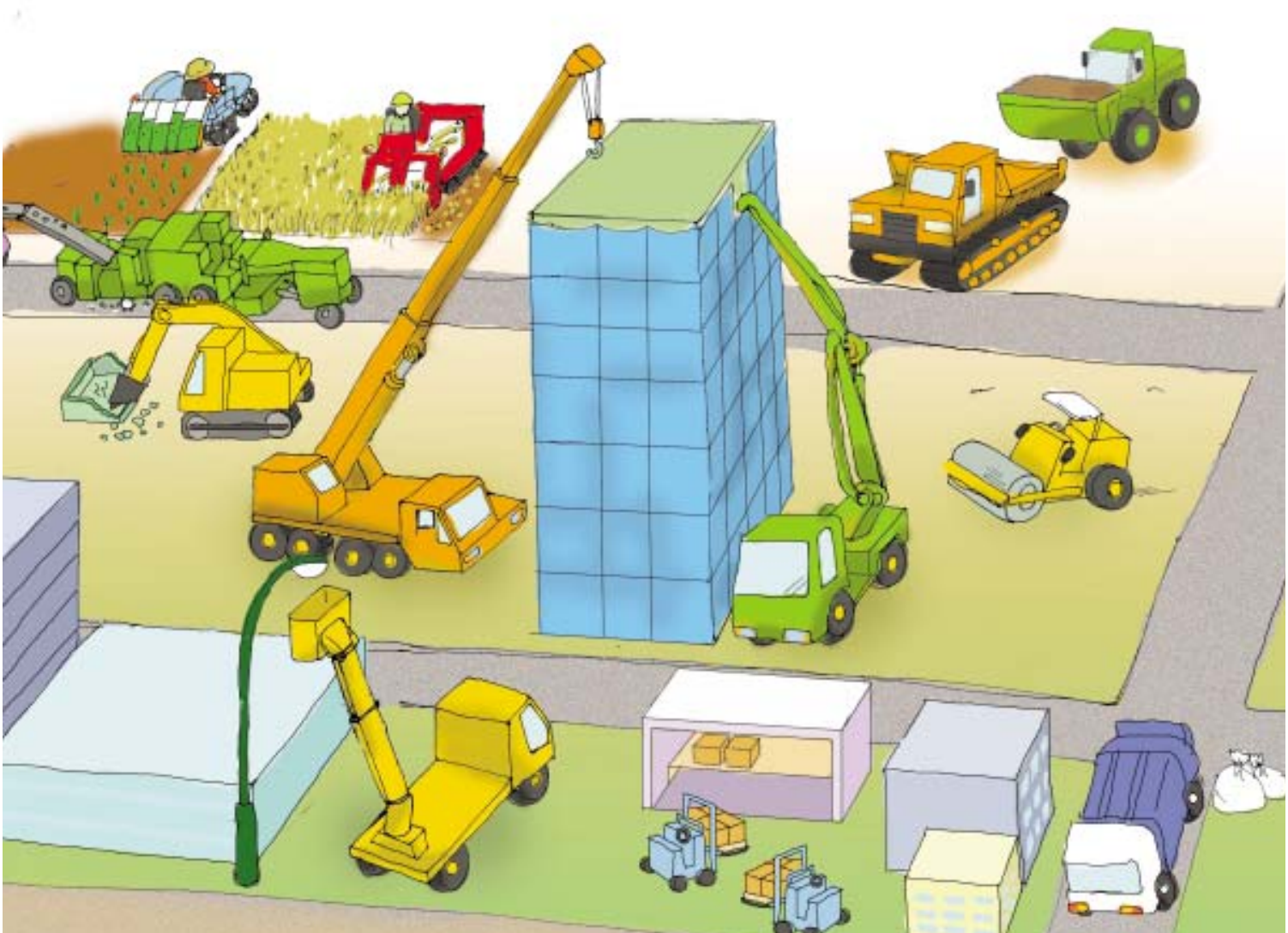
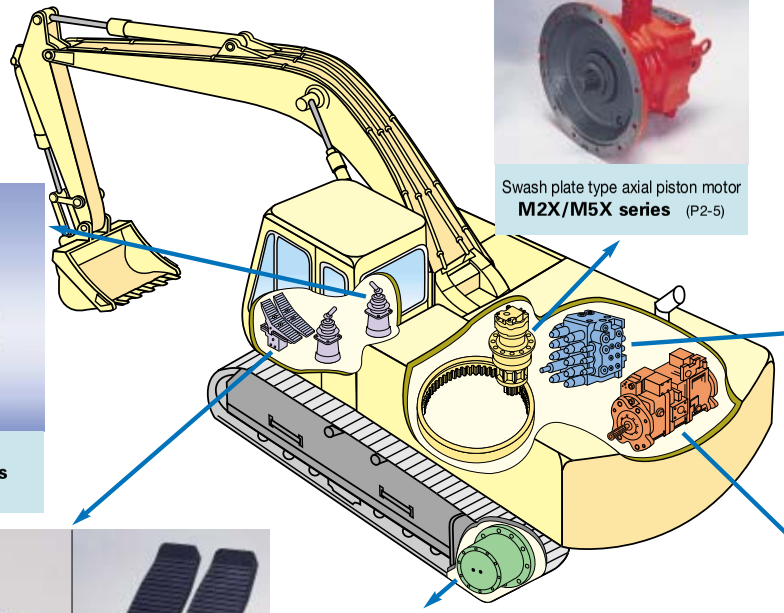


Hydraulic Excavator

Kawasaki has been supplying hydraulic components to this market since the 1960's when Hydraulic Excavators first became widely established. Since then Kawasaki has been successively developing and manufacturing hydraulic pumps to provide the immense power source required by these earth moving machines. Kawasaki has also developed Hydraulic Motors to apply this power to enable the machines movement and various Control Valves to provide the operator with the precise-feel and control required to undertake a wide range of tasks from delicate soil grading to trenching, rock breaking and demolition.

As a total Hydraulic System engineering company, Kawasaki is continually contributing to the development of these high tech machines.



Swash plate type axial piston motor
M2X/M5X series (P2-5)

Pilot valve
PV48K series
(P2-10)

Pilot valve
RCV8C/RCVD8C series
(P2-10)

Pilot valve
PVD6P series
(P2-10)

Case rotating type geared motor
DNB series
(P2-6)

Swash plate type
axial piston motor
MCB series (P2-6)

Option

Holding valve
KHV series
(P2-11)

Pilot valve
PV6P series
(P2-10)

Solenoid-operated directional control valve block
KWE5 (P2-11)

Solenoid-operated directional control valve (cartridge type)
KWE5K (P2-11)

Proportional pressure-reducing valve (cartridge type)
KDRDE5K (P2-11)

Control valve
KMX19 (P2-8)

Multiple control valve
KMX series
(P2-8)

Swash plate type axial piston pump
K3V/K5V-DTP/DPH/DP series
(P2-1)

Swash plate type axial piston pump
K3V/K5V series (P2-1/2-2)

Swash plate type axial piston pump
K3SP36 series
(P2-2)
(for mini excavator)

Crawler Crane

Hydraulic Systems used in Crawler Cranes require very high powers with precise control and high reliability. In these systems Kawasaki's robust K3V/K5V series of pumps are utilized as the main hydraulic power source with M3X/M3B series motors enabling the hoisting application. The M2X-RG motor with an integral reduction gear is used to rotate the main body.

Swash plate type axial piston pump
K3V/K5V series (P2-1/2-2)

Multiple control valve
MW series (P2-8)

Control valves
(P2-13)

Case rotating type geared motor
DNB series
(P2-6)

Swash plate type
axial piston motor
MCB series (P2-6)

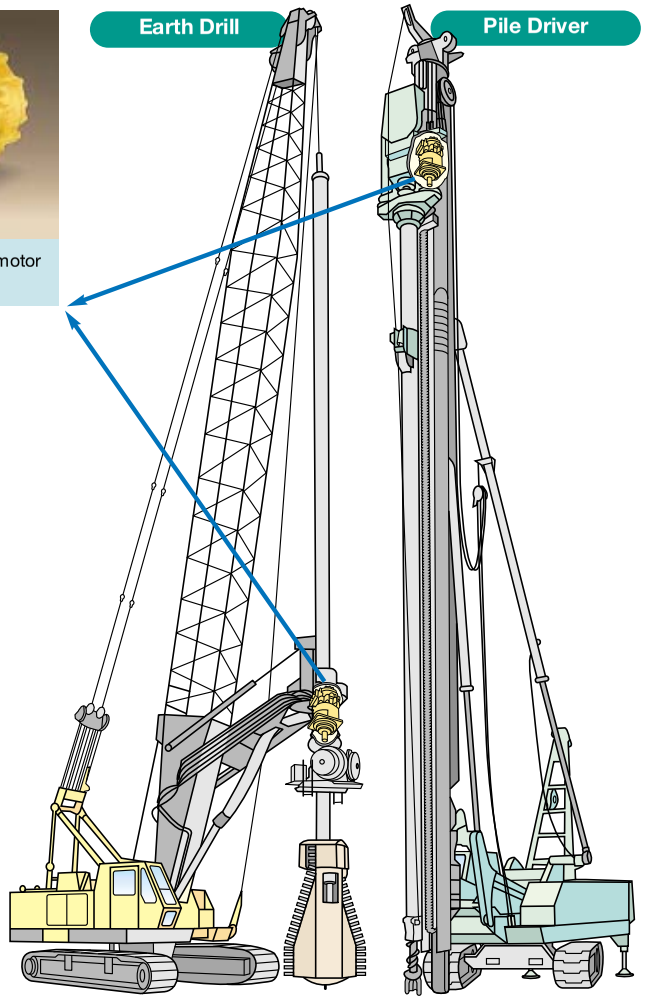
Swash plate type axial piston motor
M3X series (P2-6)

Swash plate type
axial piston motor
M3B series (P2-6)

Swash plate type axial piston motor
with reduction gear
M3X/M3B-RG series
(P2-6)

Swash plate type axial piston motor
with reduction gear
M2X-RG series
(P2-5)

Earth Drill **Pile Driver**



Pilot valve
TH40P series
(P2-10)

Pilot valve
PV6P series
(P2-10)

Solenoid-operated
directional control valve block
KWE5 (P2-11)

Rough Terrain Crane

Various Kawasaki Hydraulic components are utilized on these vehicles including High Pressure Pumps, Motors for winching and precise control valves enabling intricate lifting operations.

Swash plate type axial piston motor **M3X series** (P2-6)

Swash plate type axial piston motor **M2X/M5X-RG series** (P2-5)

Swash plate type axial piston motor **M2X/M5X series** (P2-5)

Swash plate type axial piston motor **M3B series** (P2-6)

Swash plate type axial piston pump **K3V/K5V series** (P2-1/2-2)

Pilot valve **PV48K series** (P2-10)

Solenoid-operated directional control valve block **KWE5** (P2-11)

SUN cartridge valves (P2-14)

Pilot valve **RCV8C/RCVD8C series** (P2-10)

Pilot valve **PV6P series** (P2-10)

Truck Mounted Crane

Various control options are available including the use of proportional and conventional cartridge valves with appropriate manifolds.

SUN cartridge valves
(P2-14)

Proportional pressure-reducing valve
(Cartridge type)
KDRDE5K
(P2-11)

Solenoid-operated
directional control valve block
KWE5
(P2-11)

Proportional multiple control valve
KMC series
(P2-9)

Proportional multiple control valve
with pressure compensator
KMP series
(P2-9)

Swash plate type axial piston pump
K3VL series (P2-3)

Wheel Loader

Kawasaki provide case rotating geared motors, the DNB series, and Multicam radial piston motors for wheeled loaders that run on finished or rough roads.

KML multiple control valves and a range of remote con-trol valves enable the precise operation of this vehicle.

Steering valve
KVS series (P2-11)

Pilot valve
TH40PS series
(P2-10)

Pilot valve
PV48M series
(P2-10)

Control valves
(P2-13)

SUN cartridge valves
(P2-14)

Case rotating type geared motor
DNB series (P2-6)

Multicam radial piston motor
MS/MK series
(P2-7)
(Available for Japanese customers only)

Swash plate type axial piston pump
K4V series (P2-3)

Swash plate type axial piston pump
K3V/K5V series (P2-1/2-2)

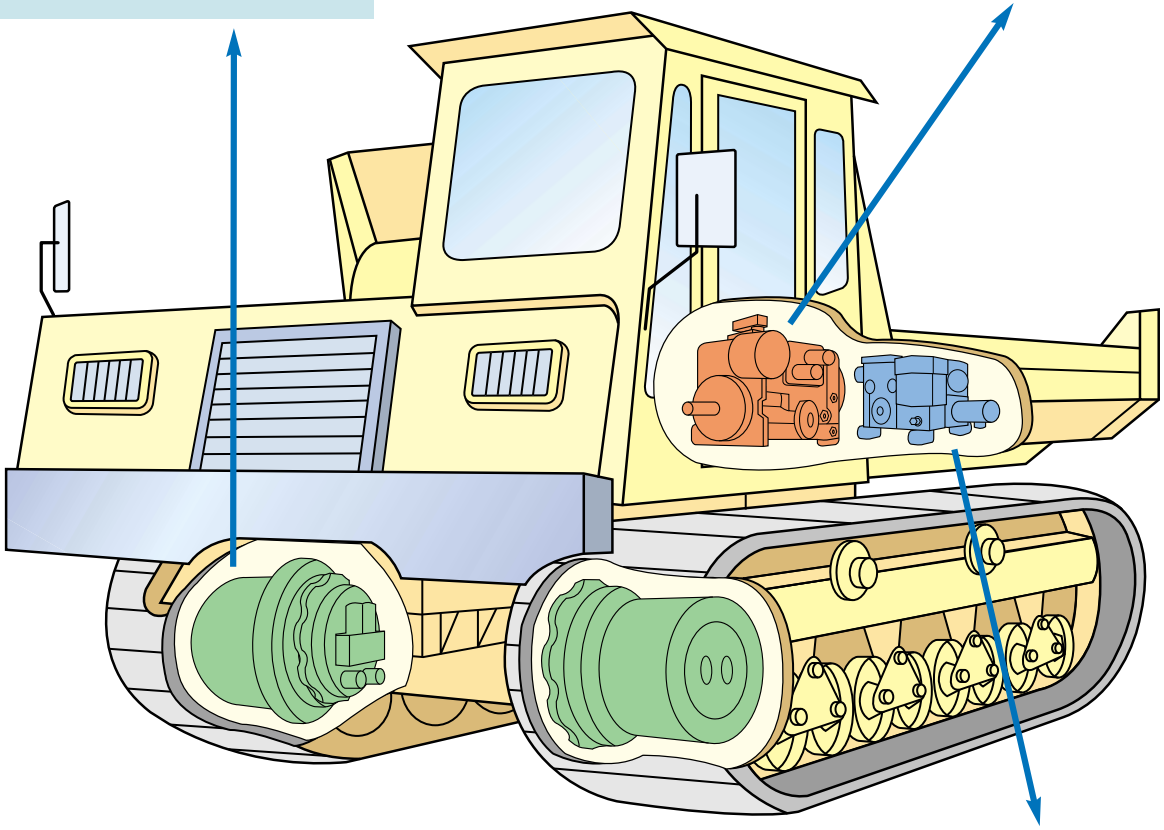
Multiple control valve
KML series (P2-8)

Carrier

The closed loop K4V pump combined with the DNB rotating case motor provides a very smooth, high torque means of travel for this vehicle.

Case rotating type geared motor
DNB series
(P2-6)

Swash plate type axial piston pump
K4V series (P2-3)



Control valves
(P2-13)

SUN cartridge valves
(P2-14)

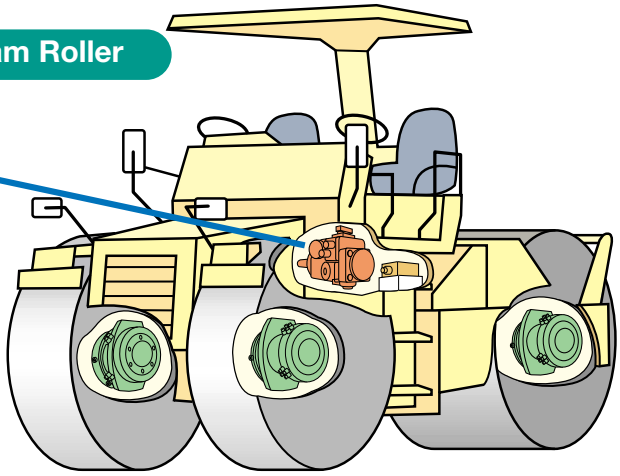
Multiple control valve
MW series (P2-8)

Roller

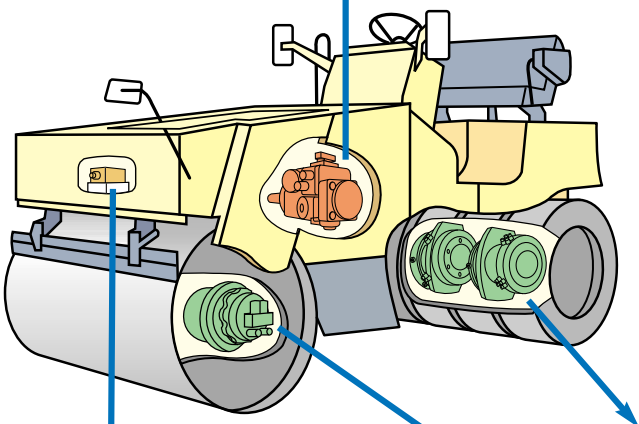
The K4V closed loop pump offers a wide range of power control which is fully utilized in this type of vehicle. Case rotating geared motors (DNB) and Multicam radial piston motors are used as drive and travel motors which enable very smooth revolutions even at low operating speeds.

Swash plate type axial piston pump
K4V series
(P2-3)

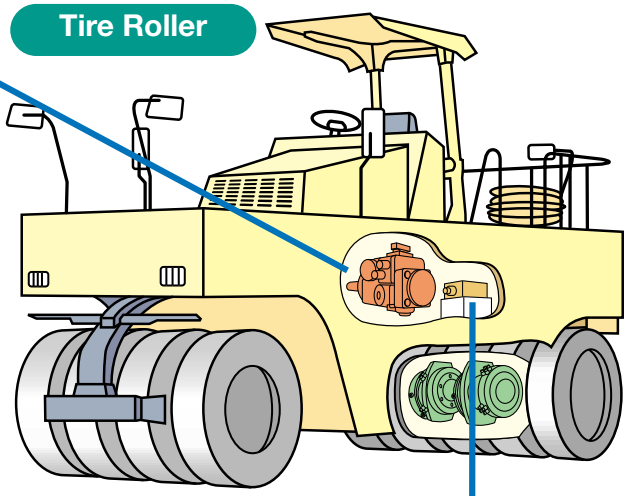
Macadam Roller



Vibratory Roller



Tire Roller



SUN cartridge valves
(P2-14)

Case rotating type geared motor
DNB series
(P2-6)

Multicam radial
piston motor
MS/MK series
(P2-7)
(Available for Japanese customers only)

Control valves
(P2-13)

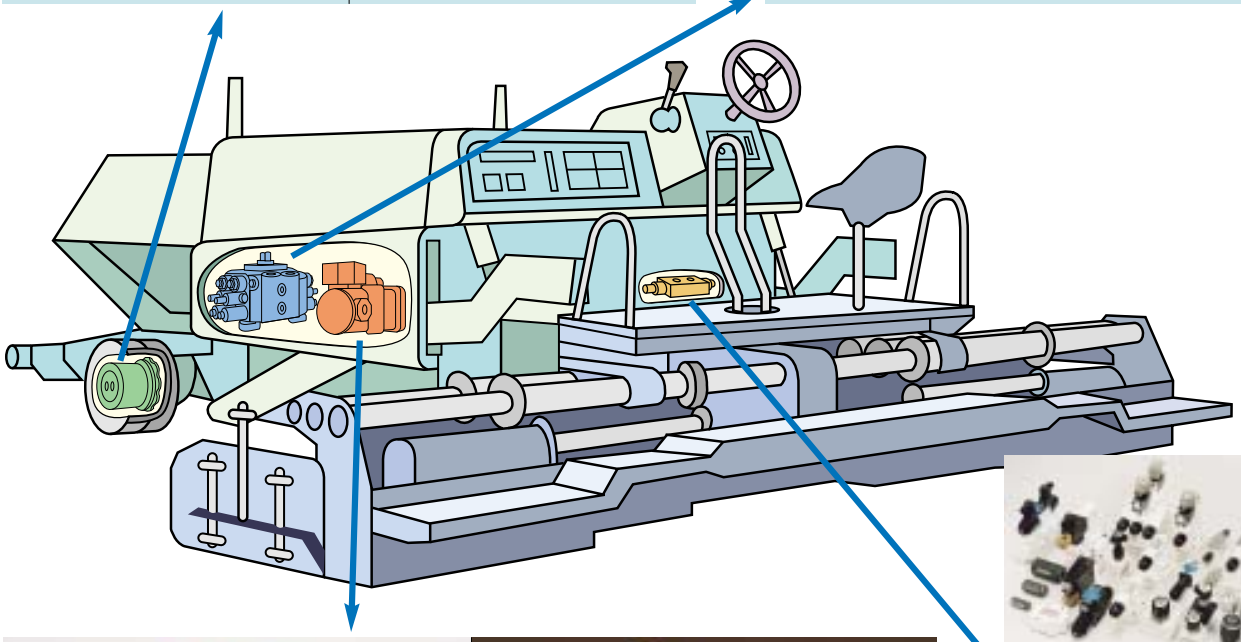
Asphalt Finisher

K3VL open loop pumps and K4V closed loop pumps are utilized in this vehicle. Motor drives are provided by DNB and MS/MK motors which are controlled by a range of multiple control valves. This combination enables a fixed speed of travel and even distribution of asphalt.

Case rotating type
geared motor
DNB series
(P2-6)

Multicam radial piston motor
MS/MK series
(P2-7)
(Available for Japanese customers only)

Proportional multiple control valve
with pressure compensator
KMP series
(P2-9)



Control valves
(P2-13)

Swash plate type axial piston pump
K3VL series
(P2-3)

Swash plate type axial piston pump
K4V series
(P2-3)

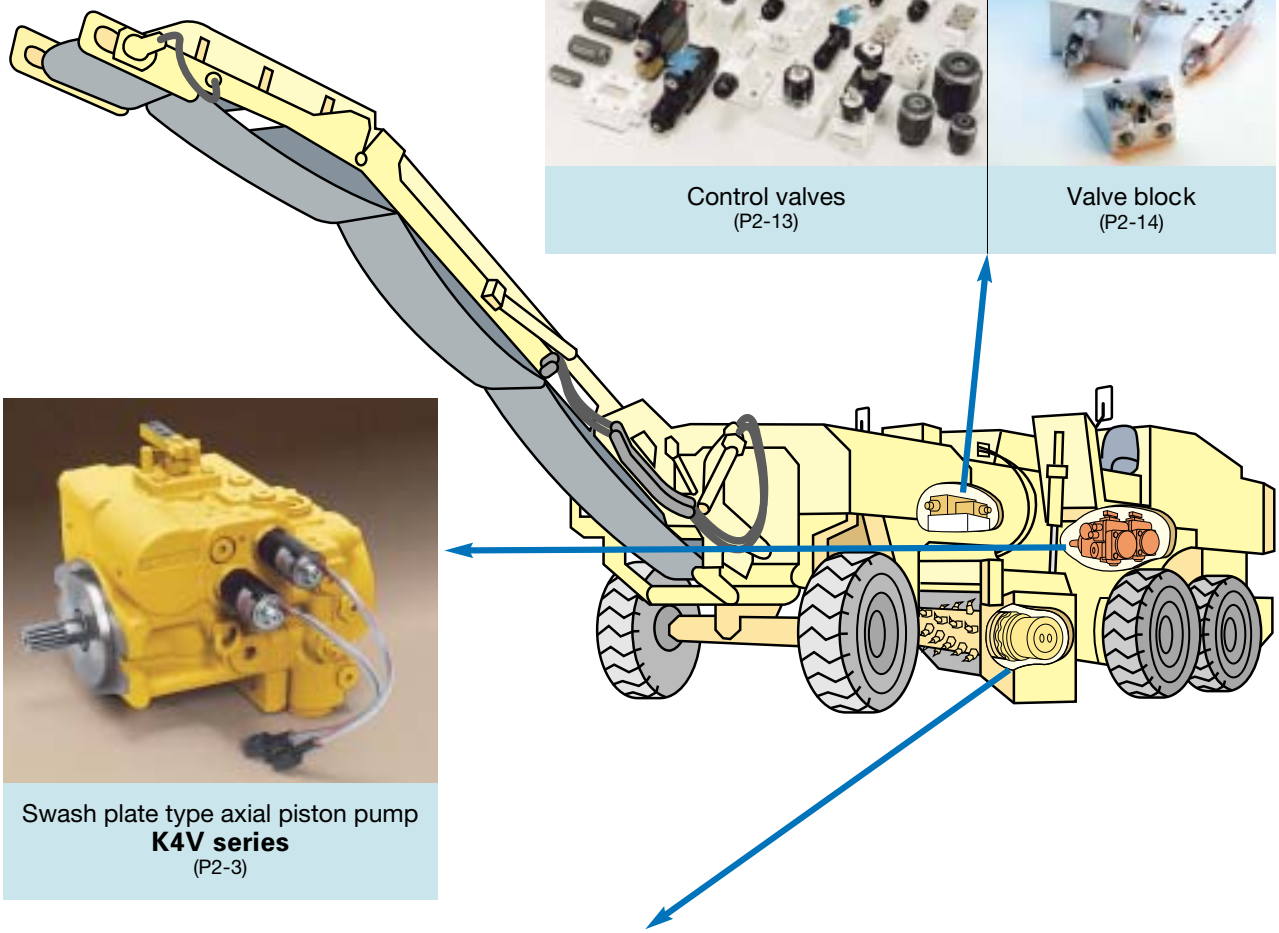
SUN cartridge valves
(P2-14)

Road surface Planer

The closed loop K4V pump is utilized as the main source of power for these machines with both M3X and DNB motors meeting the typical specifications for driving the cutter heads. Various control options are achieved by utilizing manifold blocks and cartridge valves.

Control valves
(P2-13)

Valve block
(P2-14)



Swash plate type axial piston pump
K4V series
(P2-3)

Swash plate type axial piston motor
M3B series
(P2-6)

Swash plate type axial piston motor
M3X series
(P2-6)

Case rotating type geared motor
DNB series
(P2-6)

Concrete Pump

High pressure K3V and medium pressure K3VL axial piston pumps are typically used in these concrete pumps. M3X Swing motors are used to rotate the boom. These components enjoy an established reputation in excavator manufacture and are equally suited to these applications. Shock less control of boom extension and contraction is achieved by utilising proportional multiple control valves with pressure compensator.

Control valves
(P2-13)

SUN cartridge valves
(P2-14)

Swash plate type axial piston motor
M3X series
(P2-6)

Proportional multiple control valve
KMC series
(P2-9)

Proportional multiple control valve
with pressure compensator
KMP series
(P2-9)

Swash plate type axial piston pump
K3V/K5V series
(P2-1/2-2)

Case rotating type geared motor
DNB series
(P2-6)

Crawler Drill

K3V/K5V and K3VL open circuit piston pumps are again typically used in these applications. Composite valve blocks, remote pilot valves and cartridge valves provide a complete range of control options.

Swash plate type
axial piston pump
K3V/K5V series
(P2-1/2-2)

RCV8C/RCVD8C series
(P2-10)

Swash plate type axial piston motor
M3X series
(P2-6)

Swash plate type
axial piston pump
K3VL series
(P2-3)

Pilot valve
TH40P
(P2-10)

Control valves
(P2-13)

Valve block
(P2-14)

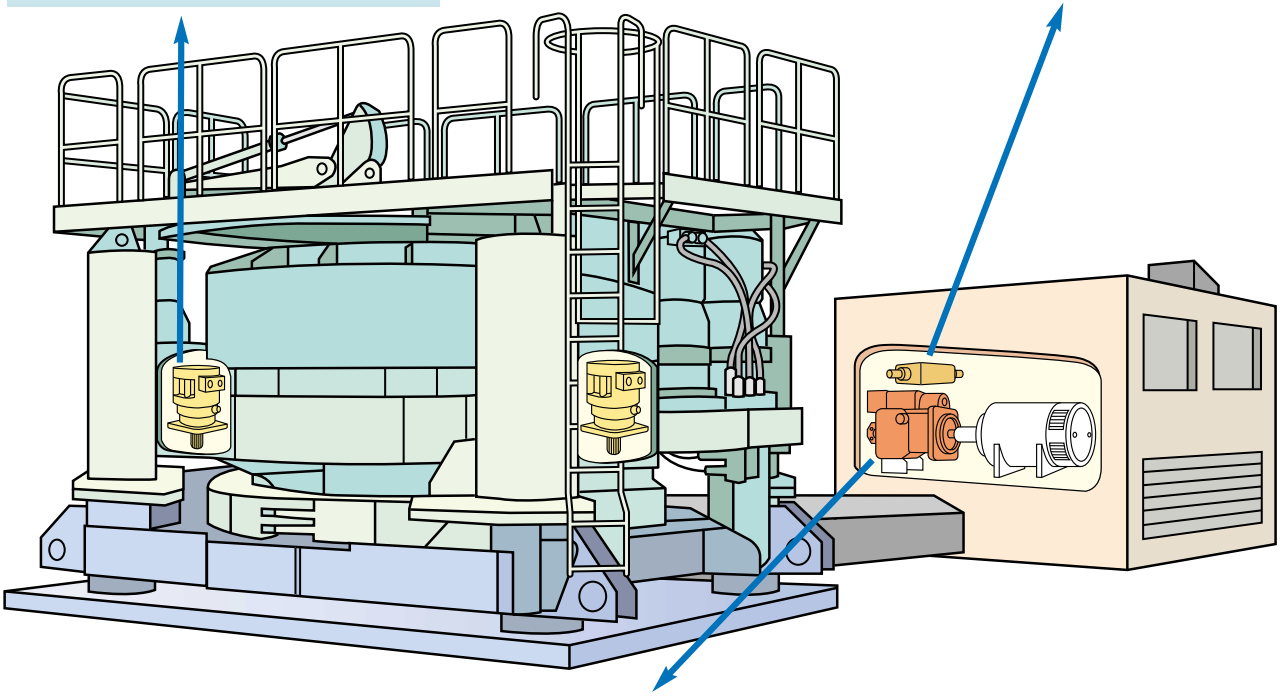
Case rotating type geared motor
DNB series
(P2-6)

Casing Driver

As to the Case rotating type driver that widely takes an active part in removing of the pillar line execution and foundation of the steel tube,the Swash plate type axial piston motor M3X/M3B series is used for the rotation of the casing that requires enormous power. The source of oil pressure is supported by the pumps of K3V, K3VG and K3VL series having the good reputation in high output density design.

Swash plate type axial piston motor
M3X/M3B series
(P2-6)

Control valves
(P2-13)



Swash plate type axial piston pump
K3V/K5V series
(P2-1/2-2)

Swash plate type axial piston pump
K3VG series
(P2-4)

Swash plate type axial piston pump
K3VL series
(P2-3)

Crusher

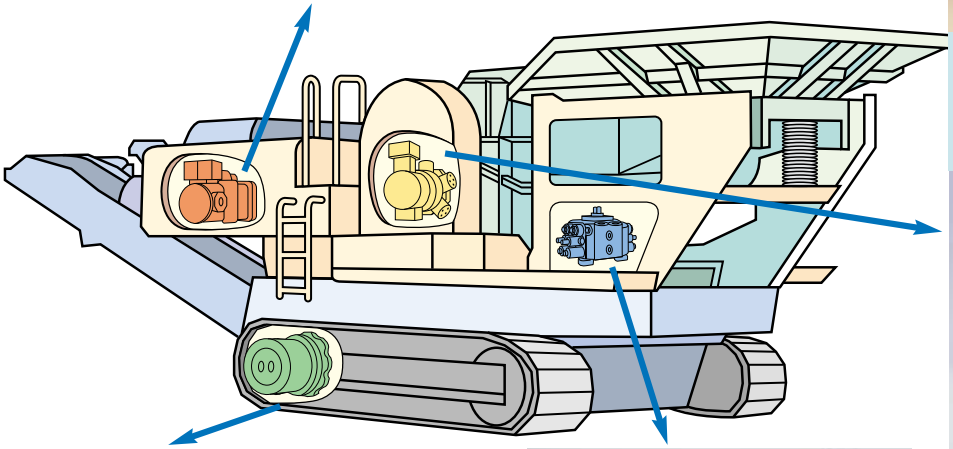
K3V/K5V and K3VL open circuit piston pumps are frequently installed in these machines.

A range of suitable motor types are also available including Axial, Radial or Multicam Motors depending upon the specific application.

Swash plate type axial piston pump
K3V/K5V series
(P2-1/2-2)

Swash plate type axial piston pump
K3VL series
(P2-3)

Swash plate type
axial piston motor
M3X/M3B series
(P2-6)



Low speed,
high torque radial piston motor
HMKB series
(P2-7)

Case rotating type
geared motor
DNB series
(P2-6)

Proportional multiple control valve
with pressure compensator
KMP series
(P2-9)

Multicam radial piston motor
MS/MK series
(P2-7)
(Available for Japanese customers only)

Control valves
(P2-13)

SUN cartridge valves
(P2-14)

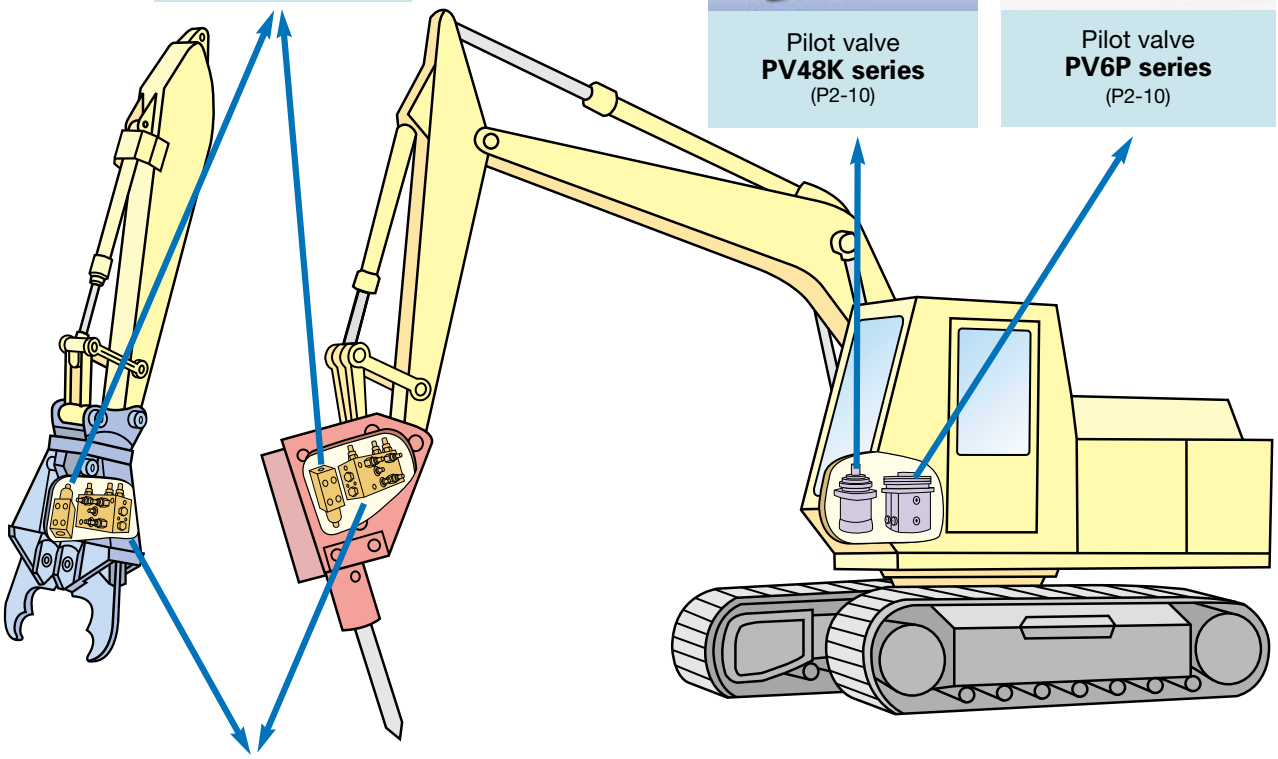
Hydraulic Braker / Crusher Jaw

These attachments are frequently used to break and crush work pieces and they require both fast powerful movement and, on occasion, the highly controlled smooth and slow application of force. The variety of Proportional, Directional and Pilot valves available from Kawasaki ensure these specifications are always met.

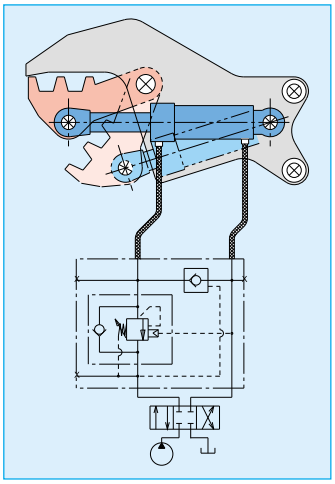
SUN cartridge valves
(P2-14)

Pilot valve
PV48K series
(P2-10)

Pilot valve
PV6P series
(P2-10)



SUN cartridge valve block
(P2-14)



An application of regenerative circuit >

Solenoid-operated
directional control valve
KWE5 (P2-11)

Industrial Vehicle

Forklift Truck

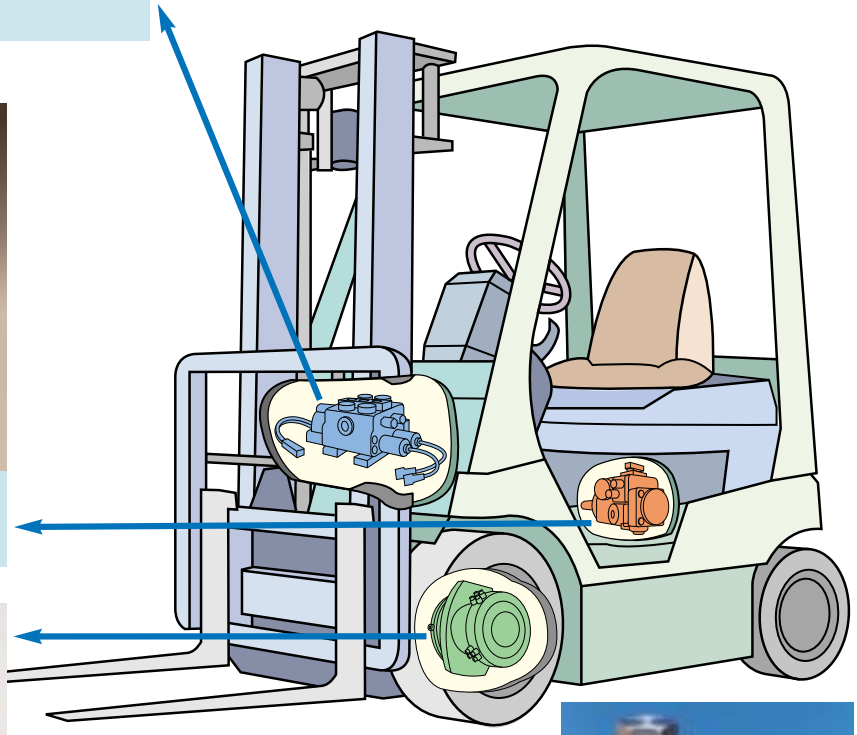
The KMC10L proportional multiple control valve and the compact MW multiple control valve have an exceptional reputation when applied to fork lift applications.

Excellent control characteristics, minimum leakage and a very compact installation envelope make these valves the preferred choice in fork lift applications.

Proportional multiple control valve
for forklift truck
KMC10L (P2-9)

Multiple control valve
MW series (P2-8)

Swash plate type axial piston pump
K4V45 (P2-3)



Multicam radial piston motor
MS/MK series
(P2-7)
(Available for Japanese customers only)

Proportional pressure-reducing valve
KDRDE series
(P2-11)

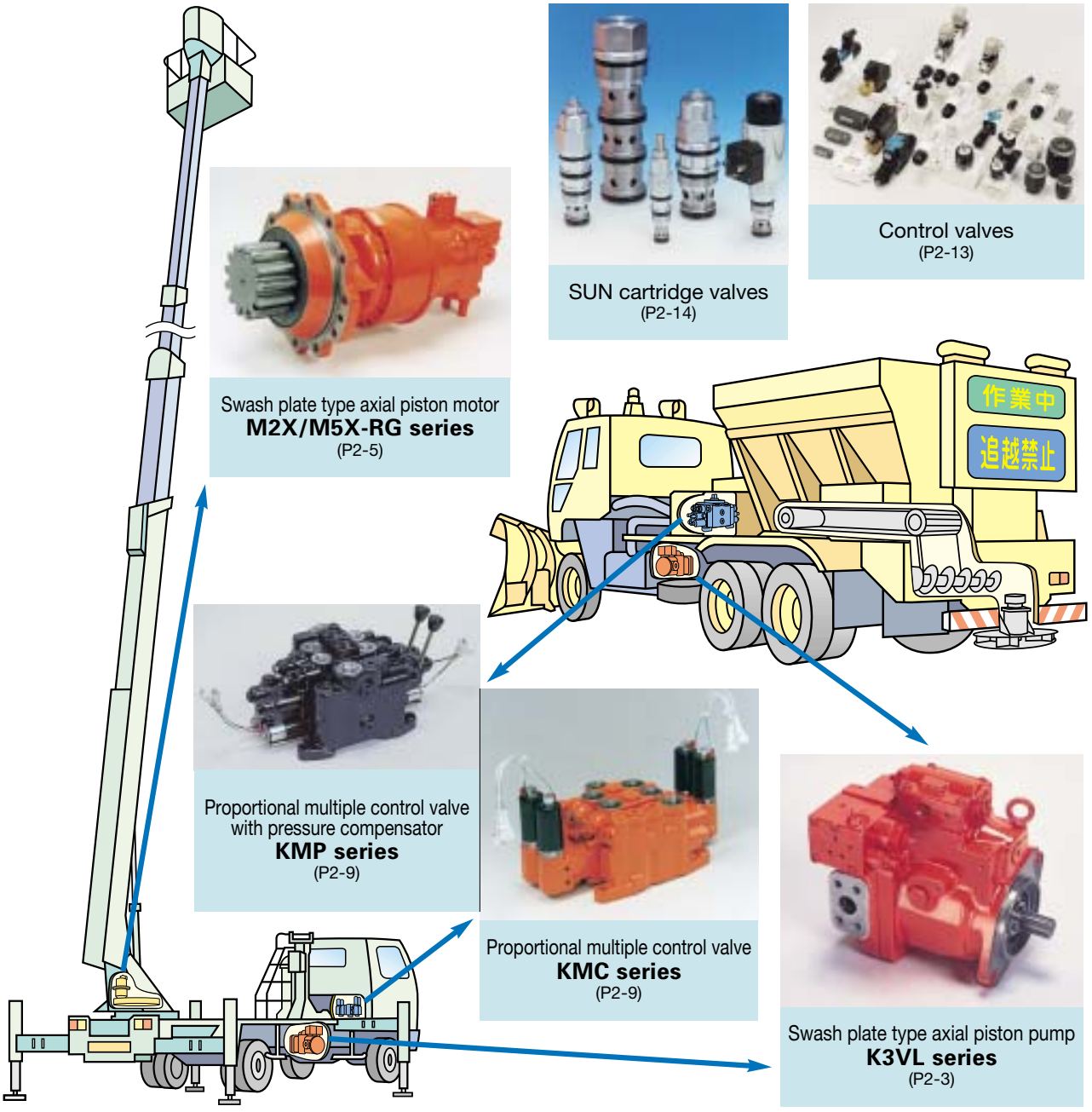
SUN cartridge valves
(P2-14)

Manlift

A combination of the K3VL high pressure pump and the KMP proportional multiple control valve with pressure compensator provide the basis for a highly accurate speed and position control for man lift applications.

Snow Plough / Gritter

KMC and KMP multiple control valves are used to control the accurate scatter of de-icing road salts within these gritter applications.



Swash plate type axial piston motor
M2X/M5X-RG series
(P2-5)

SUN cartridge valves
(P2-14)

Control valves
(P2-13)

Proportional multiple control valve with pressure compensator
KMP series
(P2-9)

Proportional multiple control valve
KMC series
(P2-9)

Swash plate type axial piston pump
K3VL series
(P2-3)

Refuse (Garbage) Truck

Small compact components such as the high pressure K3VL, KMP proportional multiple control valves and cartridge valves are ideally suited to these applications.

Fire Engine

Reliable, precise and fast extension of hydraulic ladders is imperative in these applications and the KMP proportional multiple control valve meets this requirement. It is often used in these applications to facilitate the rapid extension of ladder sections simultaneously.

Swash plate type axial piston pump
K3VL series (P2-3)

Proportional multiple control valve with pressure compensator
KMP series (P2-9)

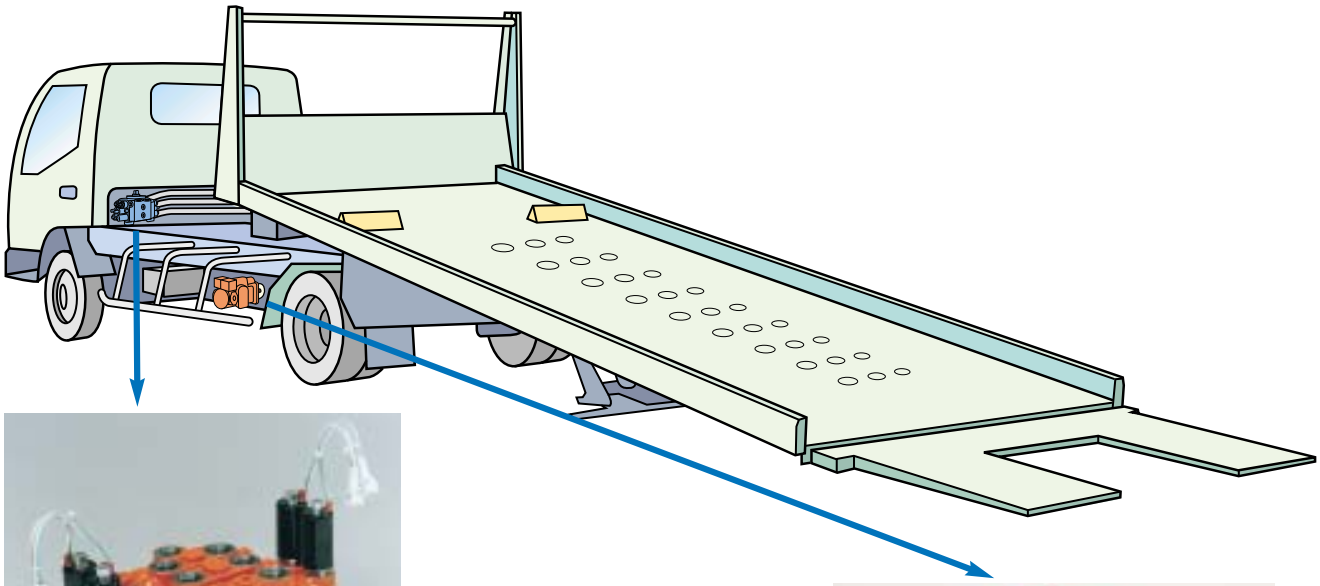
Proportional multiple control valve
KMC10L series (P2-9)

Control valves
(P2-13)

SUN cartridge valves
(P2-14)

Car Carrier / Roll-off Dumpster Truck

Multiple control valves and the K3VL series of high pressure axial piston pumps are again well suited to these applications.

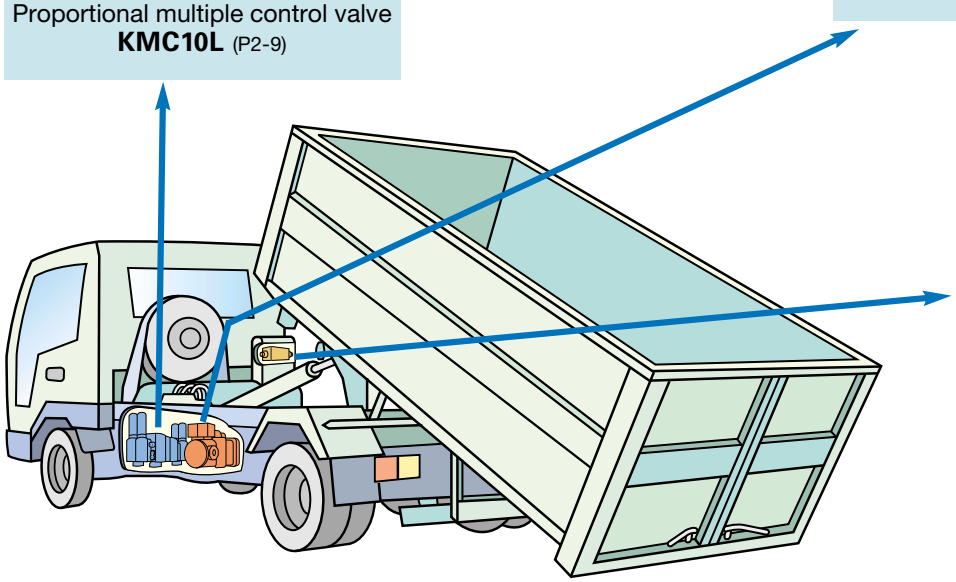


Proportional multiple control valve
KMC series (P2-9)

Proportional multiple control valve with pressure compensator
KMP series (P2-9)

Swash plate type axial piston pump
K3VL series
(P2-3)

Proportional multiple control valve
KMC10L (P2-9)



SUN cartridge valves
(P2-14)

Agricultural Machinery

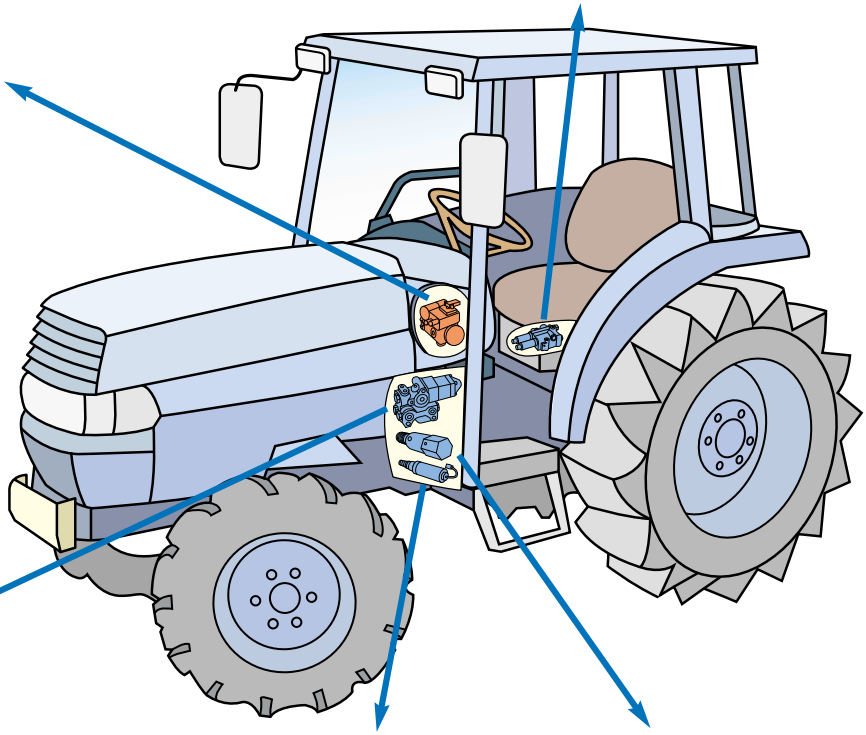
Tractor

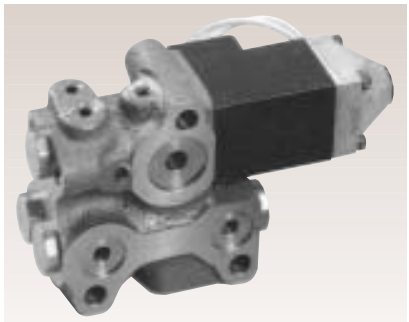
The compact KTEM8 series of multiple control valves are often used on this vehicle, KFDZE flow divider and sequence valve are also applied to provide the optimum control of hydraulic attachments.

Swash plate type axial piston pump
K3VL series
(P2-3)

Proportional control valve
KTEM series
(P2-12)

Swash plate type axial piston pump
K4V series
(P2-3)





flow dividing valve
with sequence valve
KFDZE10
(P2-12)

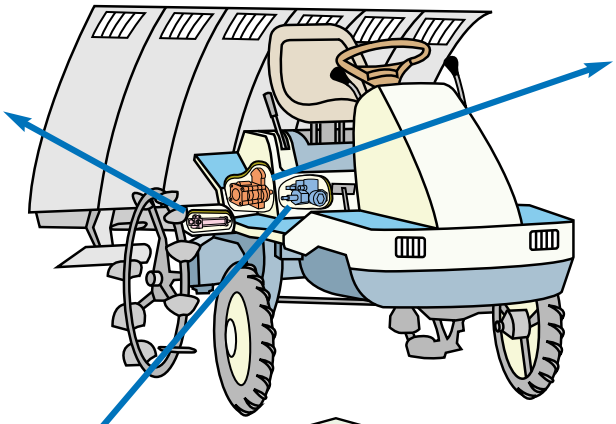
Proportional pressure-reducing valve
(Cartridge type)
KDRDE5K (P2-11)

Shockless valve
KCLA (P2-12)

Rice-planting Machine / Combine

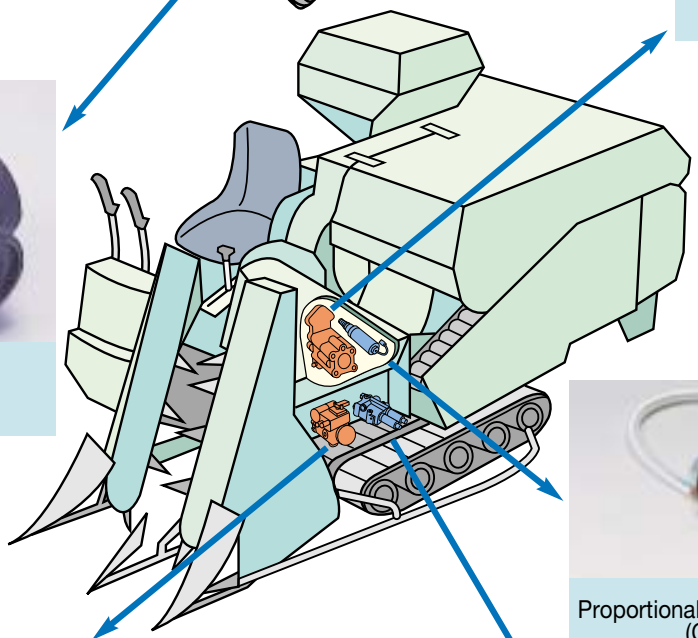
The very small and compact K3VL45 provides the power source in these machines which also utilise the KDRDE5K proportional pressure reducing valves to control the depth of planting and height of cutting implements.

Cylinder unit
CW series



Gear Pump
ZX series
(P2-4)

Control valve
CV series (P2-12)



Proportional pressure-reducing valve
(Cartridge type)
KDRDE5K (P2-11)

Swash plate type axial piston pump
K3VL series (P2-3)

Swash plate type axial piston pump
K4V45 (P2-3)

Proportional control valve
KTEM series (P2-12)

Pumps

Swash plate type axial piston pumps

•K3V series

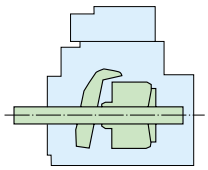
K3V-DTP

K3V112DP

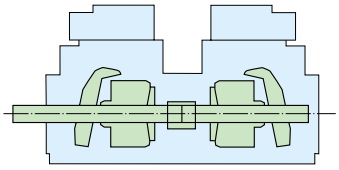
1. K3V series pumps are very popular as reliable power source for construction machines.
2. Various rotary group layouts are avail-able to respond to applications.
3. Tandem type with PTO and Parallel type have joined the series.

model		K3V63	K3V112	K3V140	K3V180	K3V280
displacement cm³		63	112	140	180	280
pressure MPa(kgf/cm²)	rated	34.3(350)				
	peak	39.2(400)				
speed min⁻¹	max.for self priming	2,650	2,360	2,150	1,950	1,600
	max.	3,250	2,700	2,500	2,300	2,000

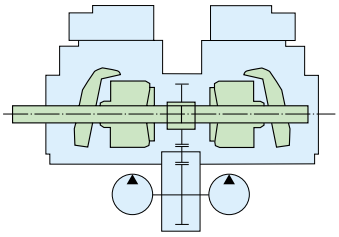
Variation



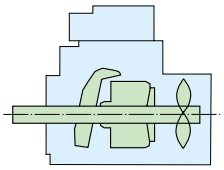
K3V___S
Single type
63~280cm³



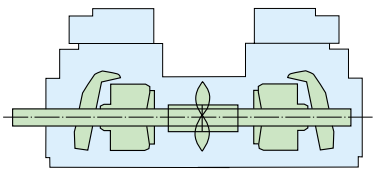
K3V___DT
Tandem type
63~180cm³



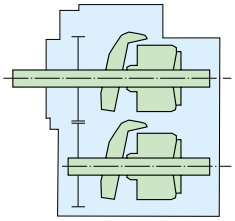
K3V___DTP
Tandem type with PTO
63~180cm³



K3V___SH
Single type with centrifugal pump
180·280cm³



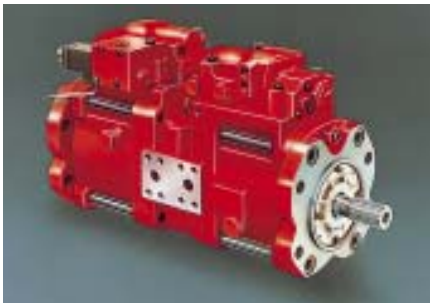
K3V___DTH
Tandem type with centrifugal pump
180·280cm³



K3V___DP
Parallel type
112·180cm³

Swash plate type axial piston pumps

•K5V series



K5V-DPH

1. With new technology the K5V series has realized higher power density.
2. K5V series can cope with enlargement of displacement despite the same installa-tion dimensions and regulator variations as K3V's.
3. K5V series pumps have realized higher reliability and long life so as to meet requirement of larger torque.

model		K5V80DT/DTP	K5V140DT/DTP	K5V200DPH/DTH/DTP
displacement cm^3		80 X 2	140 X 2	200 X 2
pressure MPa(kgf/cm^2)	rated	34.3 (350)		
	peak	39.2 (400)		
speed min^{-1}	max.for self priming	2,460	2,160	1,850
	max.	3,000	2,500	2,200

Swash plate type axial piston pumps

•K3SP series

1. This is a compact double pump for a small size construction machine.
2. The tilting angle control of the swash plate is conducted by the hydraulic pres-sure pis-ton which composes the pilot and the servomechanism.
3. The centrifugal pump for sucking pres-sure charge is built in the sucking pas-sage to improve the self-inhale perfor-mance in a high revolution area.

model		K3SP36
displacement cm^3		36 X 2
pressure MPa(kgf/cm^2)	rated	29.4 (300)
	peak	31.4 (320)
max. speed for self priming min^{-1}		2,800

Pumps

•Title / Blue : standard

Swash plate type axial piston pumps

•K3VL series

1. The K3VL series swash-plate type axial piston pump is a heavy duty variable displacement hydraulic pump newly developed for mobile and industrial applications.
2. The unique mechanism obtained through our long research has drastically redu-ced pressure pulsation.
3. Unload and variable pressure controls are made possible remotely in addition to load-sensing and pressure constant.
   In addition, the horsepower control is available.

model		K3VL45	K3VL80	K3VL112	K3VL140
displacement cm³		45	80	112	140
pressure MPa(kgf/cm²)	rated	31.4 (320)			
	peak	34.3 (350)			
max. self priming speed min⁻¹		2,700	2,400	2,200	

Swash plate type axial piston pumps

•K4V series

1. The K4V series is a swash plate type piston pump developed for hydro-static transmissions used in a closed circuit, and has many optional accessories.
2. Achieving high efficiency not only at high pressure but also at low pressure and low flow.
3. A mechanical neutral position retaining mechanism with a spring return has been adopted to meet the HST require-ment when kept in the neutral position.

model		K4V45C	K4V112
displacement cm³		45	112
pressure MPa(kgf/cm²)	rated	31.4 (320)	
	max.	34.3 (350)	
speed min⁻¹	rated	2,900	2,150
	max.	3,600	2,700

Swash plate type axial piston pumps

•K3VG series

1. The K3VG series is a very suitable pump for industrial machinery with open cir-cuits and has 63-560cm³ pump sizes.
2. Including a highly precise electro-hidraulic servo regulator "ILIS", good varieties of control methods are avail-able.
3. Silent and high-pressure pump with high efficiency and reliability.

model		K3VG-63	K3VG-112	K3VG-180	K3VG-280	K3VG-180DT	K3VG-280DT
displacement cm³		63	112	180	280	360	560
pressure MPa(kgf/cm²)	rated	34.3 (350)					
	peak	39.2 (400)					
speed min⁻¹	rated	1,800			1,200	1,800	1,200
	max.for self priming	2,600	2,200	1,850	1,600	1,850	1,600
	max.	3,250	2,700	2,300	2,000	2,300	2,000

Gear pumps for farm machines

•ZX series

1. This is a gear pump with a high efficien-cy and a long life developed for the agri-cultural machinery based upon our rich production technology of a precision gear pump.
2. We also have another compact form in which both a gear pump and a switching valve are unified.

displacement cm³		2.4	4	7
pressure MPa(kgf/cm²)	rated	3.1 (32)	6.4 (65)	5.4 (55)
	peak	3.9 (40)	9.3 (95)	8.3 (85)
max. self priming speed min⁻¹		1,750	2,000	1,900

Motors

Swash plate type axial piston motors

•M2X/M5X series

1. The M2X series are swash plate type piston motors developed for application to swing-ing operation of construction machines, and are provided with a built-in mechanical brake, a relief valve, and a make-up valve.
2. The design has enabled an extraordinari-ly compact motor with the piston/cylin-der part, mechanical brake part, and attached valves part neatly arranged respectively.
3. The mounting flange of the motor has been so enlarged as to enable it to be directly connected with the ring gear of a reduction gear.
4. M5X has been developed to realize the lighter weight, more compact size and stronger output power on the basis of M2X technology.

model		M2X22	M2X45	M2X63	M5X130	M5X180	M2X210
displacement cm^3		22.0	45.3	64.0	129	180	210
pressure MPa(kgf/cm^2)	rated	20.6 (210)		29.4 (300)	32.4 (330)		29.4 (300)
	max.	24.5 (250)		34.3 (350)	39.2 (400)		34.3 (350)
max.speed min^{-1}		2,500	2,000	2,200	1,850	1,680	1,400

Swash plate type axial piston motors with reduction gears

•M2X/M5X-RG series

model	M2X 22-RG015	M2X 45-RG035	M2X 63-RG06	M5X 130-RG10	M5X 180-RG16	M5X 180-RG20
displacement cm^3	597	1,185	1,229	2,437	4,128	4,264
rated pressure MPa(kgf/cm^2)	15.7 (160)	17.7 (180)	28.0 (285)	27.5 (280)	24.0 (245)	29.4 (300)
max.speed min^{-1}	92	76	115	92	68	66

Swash plate type axial piston motors with reduction gears for swinging operation of crane

•M2X/MX-RG series

1. The service brake (option) is possible to be installed.
2. The reduction gear of M2X series is designed to shorten the length in the axial direction.
3. The M2X series is a compact motor with good results in the shovel turn. The par-king brake is built in the motor.

model	M2X170-RG17C27	M2X170-RG23C34	MX250-RG100C88
displacement cm^3	4,625	5,743	22,226
rated pressure MPa(kgf/cm^2)	23.0 (235)	24.5 (250)	27.5 (280)
theoretical output torque N·m(kg·m)	16,960 (1,729)	22,410 (2,285)	97,100 (9,910)
service brake	hand brake	hand brake	hydraulic brake

Swash plate type axial piston motors

•M3X/M3B series

The M3X/M3B series is a swash plate type axial piston motor with a good self-priming capability and high starting effi-ciency, developed based on our many years of experience and technology obtained in swash plate type pumps and motors.

model		M3X 200	M3X 280	M3X 530	M3X 800		M3B 200	M3B 280	M3B 530	M3B 800
displacement cm^3		195	280	533	800	max.	195	280	533	800
						min.	106	93	178	267
pressure MPa(kgf/cm^2)	rated	29.4(300)					32.0 (326)	29.4 (300)		
	peak	34.3(350)					35.0 (357)	34.3 (350)		
max.speed min^{-1}		1,900	1,700	1,400	1,200	max.	1,900	1,700	1,400	1,200
						min.	2,400	2,200	1,700	1,500

Swash plate type axial piston motors with reduction gears

•M3X/M3B-RG series

model	M3X200-RG03S6.0	M3X280-M3B280-RG06S6.4	M3X530-M3B530-RG10S6.4	M3X800-M3B800-RG16S6.4
displacement cm^3	894	1,587	3,104	4,717
rated pressure MPa(kgf/cm^2)	20.6(210)			
max.speed min^{-1}	270	190	150	130

Case rotating type geared motors

•DNB series

The DNB series is a case-rotating type dual speed motor. With various optional accessory valves, this series can be used in both open and closed circuits.

model	DNB04E	DNB08D	DNB15B	DNB50	DNB60
displacement cm^3	880	2,046	4,010	10,700	11,600
	484	1.025	2,010	6,760	6,760
rated pressure MPa(kgf/cm^2)	34.3(350)				
max.speed min^{-1}	50	27	27	28	21
	91	55	55	36	36

Swash plate type axial piston motors

•MCB series

The MCB series is a built-in type dual speed motor for traveling of excavators and other industrial vehicles.
This series has been developed based upon the DNB series.

model	MCB195	MCB530
displacement cm^3	195/116	530/325
rated pressure MPa(kgf/cm^2)	34.3(350)	
max.speed min^{-1}	1,900/2,300	1,400/1,690

Low speed, high torque radial piston motors

•HMKB(C)series

1. Richest and longest service experiences in screw driving of injection molding machines.
2. Available of many kinds of options such as valve-mounting type for speed changing.
3. Available of a CHP valve which can auto-matically change the speed steplessly in response to the load. (Constant horse-power control)

Fixed displacement type

model		SX 504BM	SX 505BM	HMKB 046	HMKB 075	HMKB 100	HMKB 200	HM(HD)B 270	HM(HD)B 325	HMHDB 400	HMB 700
displacement	cm^3	189	492	745	1,281	1,510	3,087	4,310	5,310	6,800	11,600
pressure MPa(kgf/cm^2)	rated	20.6(210)									
	max.	24.5(250)									

Dual–displacement type

model		SB 504	SB 505	HMKC 046	HMKC 075	HMKC 080	HMKC 200	HMC 270	HMC 325
displacement	cm^3	202	492	745	1,241	1,475	3,087	4,588	5,326
pressure MPa(kgf/cm^2)	rated	20.6(210)							
	max.	24.5(250)							

Multicam radial piston motors

•MS/MK series

1. This series has been taking an active part in various fields as a running motor for the agricultural tractor and fork-lift, and for driving the cutter of the shielding machine, for the winch and for driving the screws of the injection molding machine and so on.
2. The piston strokes 6~8 times per revo-lution with the structure that the piston roller goes round inside the cam ring. Therefore smooth revolution can be ob-tained even at the low speed revolution.
3. Maximum working pressure can be as high as 45 MPa, and dual speed motors as well as various functions are available like parking brakes, free-wheeling (running idly), and so forth.

model		02	05	08	11	18	25	35	50	83	125
displacement	cm^3	213	468	780	1,048	1,747	2,498	3,494	4,996	8,328	12,492
pressure*	MPa(kgf/cm^2)	37.5(382)~45(459)									
max.speed	min^{-1}	310	240	170	180	150	140	130	135	100	65

*Consult us for the working pressure range which varies depending on the form of the cam.

Valves

Multiple control valves

•KMX series

KMX15

KMX13

KMX19

1. The KMX series multiple control valves are of semi-monoblock type valves which systematically control actuators of an excavator.
2. The complicated main circuits and the pilot circuits are arranged inside the semi-monoblock housing compactly.
3. In response to customers request, unique and original circuits including special functions; for instance, straight traveling, swing priority, highly pressur-ized traveling, confluence and differential circuit, are possible.

model	KMX13	KMX15	KMX19	KMX32
max. pressure MPa(kgf/cm²)	34.3(350)			
rated flow L/min	130	240	240	360

Multiple control valves

•MW series

1. The MW (P) series multiple valves are of sectional type with several directional control valves assembled in one unit. They include relief valves, load-check valves, etc.
2. These multiple valves have three kinds of sections of parallel, series, and tandem circuits. Accordingly, they are applicable to many hydraulic circuits.

model	MW(P)25	MW(P)28
max. pressure MPa(kgf/cm²)	34.3(350)	
rated flow L/min	240	350

Multiple control valves

•KML series

The multiple control valve has been de-veloped for the wheel loader. The simul-taneous control of the boom and the bucket operation is smoothly executed.

model	KML22	KML28	KML35
max. pressure MPa(kgf/cm²)	25(255)		
max. flow L/min	200	315	600

Proportional multiple control valves

•KMC series

1. The KMC series proportional multiple control valves are applicable to various industrial vehicles such as fork-lift truck, manlift etc.
2. The internal pilot system eliminates external pilot pressure sources.
3. Parallel or tandem circuit is available on request.

max. pressure MPa(kgf/cm²)		24.5(250)	
max. flow L/min		70	
proportional solenoid	rated current A	0.7	1.6
	coil resistance Ω	17.5	3.2

Proportional multiple control valves

•KMC10L series

1. The proportion multiple control valve has been developed for the battery type fork lift based on KMC10.
2. The leakage has been reduced to 1/10 in comparison with KMC10. Natural subsi-dence and natural inclination while the fork is stopped have been substantially improved.
3. In comparison with KMC10, the pressure loss has been substantially reduced.

max. pressure MPa(kgf/cm²)		24.5(250)	
max. flow L/min		70	
proportional solenoid	rated current A	0.7	1.6
	coil resistance Ω	17.5	3.2

Proportional multiple control valves with pressure compensator

•KMP series

1. The KMP Series proportional multiple control valves with pressure compen-sator are applicable to electrical control of various industrial vehicles.
2. The internal pilot system eliminates external pilot pressure sources.
3. In case of emergency, manual operation is available by the attached lever.

max. pressure MPa(kgf/cm²)		30.9(315)	
max. flow L/min		80(P,T port)	
max. controlled flow L/min		70(A,B port)	
proportional solenoid	rated current A	0.7	1.6
	coil resistance Ω	17.5	3.2

Pilot valves

•PV series

PV48K

PV48M

PV6P

PVD6P

1. PV series valves are pressure-reducing type pilot valves to simultaneously con-trol spools of multiple control valves and the tilting angle of variable displacement pumps and so forth.
2. The operational torque can be reduced according to the customer's require-ment(Patent registered), and the small operational force enables minute control.
3. Reduced pressure drop and quick res-ponse. (US PAT. No.6, 125, 886)
4. Ergonomic handle can contain 5 switches at the maximum.

model		PV48K	PV48M	PV6P	PVD6P
inlet pressure (max.)	MPa(kgf/cm²)	6.9 (70)			
output pressure	MPa(kgf/cm²)	0~2.9 (0~30)			
rated flow	L/min	20	15	10	
main use		Excavator	Mini Excavator	Rough Terrain Crane	(Mini) Excavator
features		Joy stick type	Joy stick type compact	Bankable type compact	Pedal for propelling with damper

Pilot valves

•RCV series

1. Good anti-dust, splash-proof and dura-bility construction (Patent registered).
2. Reduced pressure drop and quick response.
3. Our unique mechanism enables stable performance over a wide range of tem-perature.
4. Damping force depending on velocity is given at any position of the operating lever. (RCVD8C series)

inlet pressure (max.)	MPa(kgf/cm²)	9.8 (100)
output pressure	MPa(kgf/cm²)	0~4.4 (0~45)
rated flow	L/min	10

Pilot valves

•TH40P series

TH40P

TH40PS

TH40P series is of a banked design, the number of the directional control valves to be incorporated can be changed as required, and they best suit applications to such industri-al vehicles allowing small available mounting space as the opera-tor's cabinet of a crane.

model		TH40P	TH40PS
inlet pressure (max.)	MPa(kgf/cm²)	9.8 (100)	
output pressure	MPa(kgf/cm²)	0~2.9 (0~30)	
rated flow	L/min	20	

Valves

Solenoid-operated directional control valves

•KWE5K

1. The KWE5K series valves are solenoid-operated directional control valves which work as on/off valves for various kinds of pilot circuits. They are the most suitable for industrial mobiles operated outdoors.
2. The KDRDE5K series valves are propor-tional pressure-reducing valves. They are mainly used for controlling spools of multiple control valves and tilting angles of variable displacement pumps.

Proportional pressure-reducing valves

•KDRDE5K

max. supply pressure	MPa(kgf/cm²)	8.8 (90)
max. back pressure (allowable pressure)	MPa(kgf/cm²)	1 (10)
max. flow rate	L/min	10

Solenoid-operated directional control valve

•KWE5

1. Installation in small space is possible on account of monoblock construction.
2. Easy piping due to the provision of only one P port and one T port for all the valves.

max. pressure MPa(kgf/cm²)	port P.A	8.8 (90)
	port T	1 (10)
max. flow	L/min	16

Holding valves

•KHV/KHCV series

1. The usage of a poppet type holding part minimizes the leakage.
2. A relief valve is incorporated.
3. Position control of the poppet enables a fine control of flow rate. (KHCV series)

model			KHV		KHCV		
size			10	20	20	25	32
max. pressure		MPa(kgf/cm²)	34.3 (350)		34.3 (350)		
rated flow	(A→B)	L/min	100	280	150	250	330
leakage	(at 20cSt, 20MPa)	cm³/min	5		5		

Steering control valves

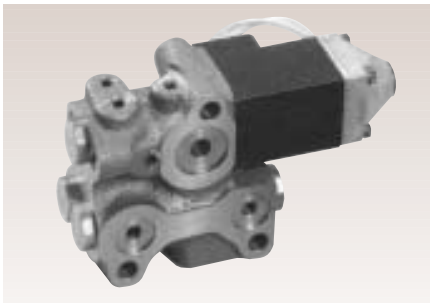
•KVS

1. This is a control valve giving priority to the steering circuit.
2. Steering surplus oil is able to be used for other circuits with the carry-over.
3. Two methods of orbit-roll and hydraulic pressure pilot are possible.

model		KVS25	KVS32
max. pressure	MPa(kgf/cm²)	21 (214)	32 (326)
max. flow rate	L/min	250	400

Flow dividing valves with sequence valve for farm machines

•KFDZ



1.KFDZ is a flow dividing valve with sequence valve.Necessary pressure at the divided flow can be maintained by operation of the built-in sequence valve even when the main circuit is unloaded.

2. As the maximum pressure of the branch flow is restricted by the reducing valve, this valve is especially suitable for con-trolling a hydraulic clutch.

max. pressure MPa(kgf/cm²)	19.6(200)
max. flow L/min	35

Proportional control valves for farm machines

•KTEM

This proportional control valve controls the flow rates into and from the actuator in proportion to the input currents to the solenoids irrespective of the working pressure.

model	KTEM8/20	KTEM8/30	KTEM8/60
max. pressure MPa(kgf/cm²)	20.6(210)		
rated flow L/min	20	30	60

Shockless valves

•KCLA6

1. This has a simple structure with a built in transmission case.

2. Excellent contamination-resistance has been realized.

max. pressure MPa(kgf/cm²)	2.9(30)
max. flow L/min	10

Control valve for rice-planting machine

•CV

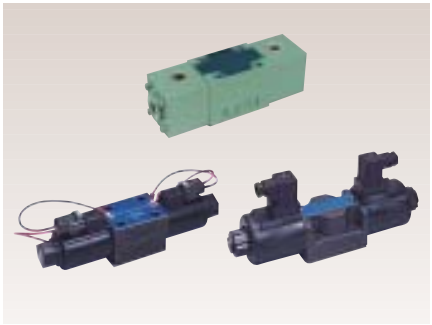
1. This control valve is able to control the up-and-down operation of the setting out section.

2. The more compact size has been real-ized by the adoption of a rotary spool.

model	CV-8A
max. pressure MPa(kgf/cm²)	8.34(85)
rated flow L/min	15.6

Valves

•Directional control valves



•Pressure control valves

•Flow control valves

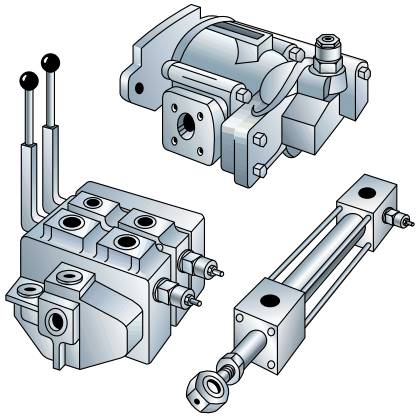
product	model	max. pressure MPa(kgf/cm²)	max. flow L/min
Directional control valves			
sol. operated directional valve	DE	30.9(315)	6, 10
sol. controlled pilot operated directional valve	DEH	34.3(350)	16, 22, 32, 52, 62, 82, 102
pilot operated directional valve	DH	30.9/34.3 (315/350)	6, 10, 16, 22, 32, 52, 62, 82, 102
manually operated directional valve	DM	30.9/34.3 (315/350)	6, 10, 16, 22, 32
manually operated directional valve	K4LA	24.5(250)	6
check vave	C/C1M	30.9(315)	6, 8, 10, 15, 20, 25, 30, 52, 62, 82, 102, 125, 150
pilot operated check vave	CH (Y)	30.9(315)	6, 8, 10, 15,20, 25,30, 52, 62, 82, 102, 125, 150
Pressure control valves			
relief valve–direct type	RD	30.9/39.2/61.8 (315/400/630)	6, 8,10, 15,20, 25, 30
relief valve–balanced piston type	RB/ RBE	30.9(315)	10, 20, 30, 35, 52, 82
reducing valve-direct type	PRD	30.9(315)	6, 10
reducing valve–balanced piston type	PRB	30.9(315)	10, 20, 30
sequence valve-direct type	SD	20.6(210)	6, 10
sequence valve-balanced piston type	SB	30.9(315)	10, 20, 30
unloading relief valve	PU/ PUE	30.9(315)	10, 20, 30, 35
pressure relief valve (3 pressure ratings)	3RBE	30.9(315)	10, 20, 30
brake valve	B	30.9(315)	10, 15,20, 25,30
counterbalance valve	CBD	30.9(315)	6, 10, 15,20, 25,30
counterbalance valve-with unloading function	KDZ	24.5(250)	15, 25, 40, 63
Flow control valves			
throttle valve	T/T1M	30.9(315)	6, 8, 10, 15, 20, 25, 30, 52, 62, 82, 102
throttle and check valve	TC	30.9(315)	6, 8, 10, 15, 20, 25, 30, 52, 62, 82, 102
fine throttle valve	F	20.6(210)	5, 10
pressure-temperature compensated flow control valve	FJC	20.6/30.9 (210/315)	5, 10, 16, 30
3–directional flow control valve	FK	30.9(315)	10, 16

•Title / Blue : standard

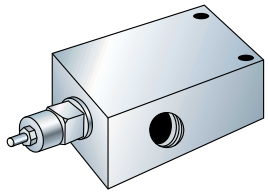
•SUN cartridge valves

Valve block

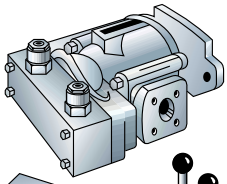
Versatile application potential

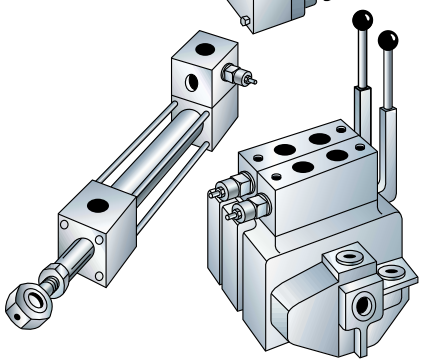


Direct integration

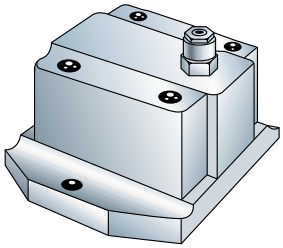


Line mounted standard blocks

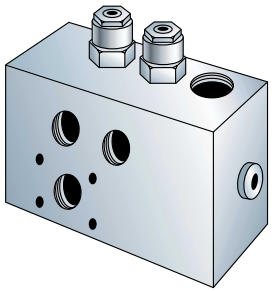




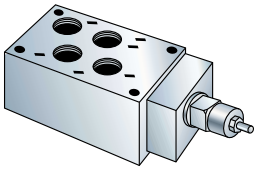
Directed mounted packages



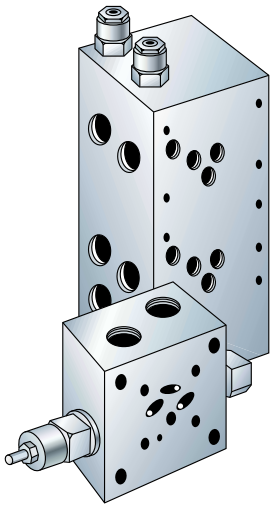
Industrial subplate mounted valves



Custom valvepacs



Sandwich valves



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