

KOMATSU



WA 320-3

active **plus**

High breakout, excellent manoeuvrability
and easy handling.

Engine output: 124 kW/168 hp (ISO 9249)

Bucket sizes: 2.6 – 3.0 m³

Operating weight: 14.0 t

Loads better comfort • Loads better for the environment • Loads better performance

If you rely on the WA320-3, you build on reliability for virtually every job.

Something to rely on.

Nothing is more reliable than a perfected machine concept based on years of wheel loader design expertise and practical experience from applications worldwide.

All of this technical know-how were bundled, refined and

realised in the new WA320-3 active-plus series. Also true for the WA320-3 is that it is one of the most powerful machines in the 14 ton class. With a cubic capacity of 8.3 litres, the KOMATSU low-emission engine is outstanding for the impressive engine output and a high torque.

The bucket capacities reach from 2.6 up to 3.0 m³. Not to be forgotten is the perfect comfort of the WA320-3 taking the burden off the driver.

100% optics with 100% functionality.

The raised rear end is a typical feature of the WA series which allows the machine to reverse into the material right up to the rear wheels thus granting maximum efficiency in stockpiling work. Moreover, the rounded



frameless front windscreen and the integrated ROPS/FOPS system are purely functional designs. This holds also true for the ease of entry which is facilitated by a wide access ladder and wide-opening doors.

Powerful job.



Fast when loading belt conveyors.

A concept approved of by accountants.

When planning to buy a wheel loader, the economical side plays an important part. The machine should provide a return on investment every single operating hour.

A challenge which the WA320-3 does not have to fear - due to its perfect workmanship, the use of high-quality materials and construction elements as well as its extremely easy serviceability. When using the novel and standard AMS-system the operating costs can be reduced further. 14 tons of pure economic efficiency set out to work for you.

Efficient in load & carry.

Excellent ergonomics are standard.

Which is why the operator will find in "his" cab not only comfort, but also a sensible and "ready-to-hand" arrangement of all operating and control elements.

A low noise level and driving characteristics plus the air conditioning finally offer the perfect travelling comfort of a car.

It works hard - wherever you put it to work.

Due to its design, the WA320-3 is perfectly suited to operate on varying sites because it is easy to transport - either on its own four wheels (road safety compliance) or on a low-loader without any problem. With this perfectly flexible "worker" you can do practically everything - from loading work in sand or gravel, the charging of recycling systems up to the digging of construction pits.



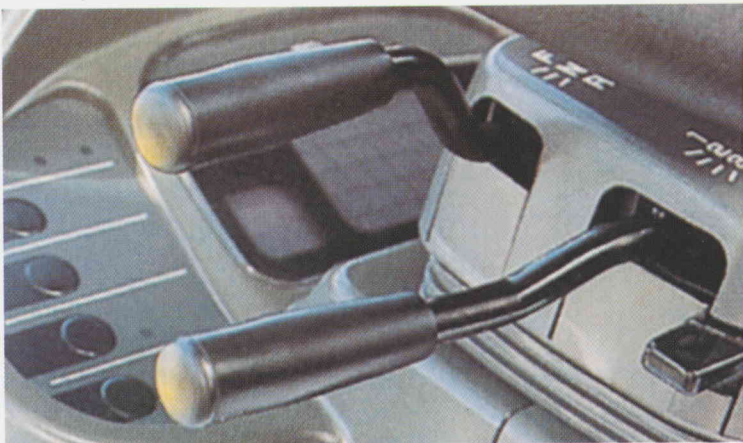
**On the one hand a comfortable workplace
with all the trimmings and maximum safety . . .**



An ergonomic perfectly designed workplace featuring air-conditioning and EDIMOS II monitor system with error and memory function.



The main monitor keeps the operator constantly informed of the various travelling functions.



Easy operation of the automatic transmission.

Climb in and feel at home.

The design of the workplace is decisive for an employee's commitment. Everybody who feels good, works better. Whether earning his pay at a desk or on a machine. That is why everything has been done on the WA320-3 to create an ideal workplace.

The force of peace.

The low noise level inside the cab results from special designed features: the operator's cab is connected to the chassis by hydrobearings, the transmission "floats" on rubber buffers. The transmission of structure borne noise from the drive units is prevented or reduced to a minimum.



**Everything in view,
everything in reach.**

The first thing you notice inside the operator's cab is the expanded legroom and the ergonomically arranged control elements. The steering column including the monitor panel can easily be adjusted to perfectly suit the driver's position. The sitting position on the standard air suspension seat is high, providing complete all-round vision and a direct view of the front wheels through the tinted windows.

The precision two-lever hydraulic control (single-lever or multi-function-lever operation upon request) is servo-controlled and, coupled with the jerk-free automatic transmission, enables speeds to be adjusted to individual working conditions with ease.

The "kick-down" function makes work even easier. It is topped off by the "gear-hold" switch which allows the operator to use the braking effect of the engine when driving downhill.

Information by monitor.

The ergonomically designed cockpit of the WA320-3 contains a main monitor which provides constant information about the current machine functions. A further control monitor reports all important data for this section, such as maintenance intervals etc., simultaneously offering an error and memory function.

***Comfortable and safe ascent to the
workplace.***

In each situation the right mode: On button pressure or automatically.

ALS **ELECTRONIC**

The electronic Automatic Load Stabiliser protecting man and machine (option).

Drastically reduced vibrations and impact due to the Electronic ALS System.

This outstanding shock reduction system works with big volume accumulators and is automatically activated at 5 km/hour. It drastically reduces vibrations and impacts. Result: Considerably less stress especially for man

and machine, e.g. during the fast load & carry tasks on uneven ground or in transit on the road. The electronic system senses input parameters covering travelling speed and gearing. The system adjusts automatically to constantly-changing operating conditions and pays for itself by increased operating performance.

APIS **SYSTEM**

*The Automatic Power-Speed-System – speed or power?
The system decides.*

Extremely flexible.

The APS system is a hydraulic system, which automatically adjusts to individual operating conditions. The system decides for itself when power is called for, or when speed would be more advantageous. The hydraulic system is remotely controlled via a servo-actuated two-lever operation (single-lever or multi-function-lever operation available as an option).

Actually it's quite simple why things suddenly go fast.

"Fast" hydraulics are required when you need to carry out short loading cycles in extremely restricted spaces. Main and automating pumps together supply a high-flow-rate of a maximum of 237 l/min at an oil pressure of up to 160 bar. Result: fast bucket lift and fast tipping.

Actually it's quite simple why power is suddenly concentrated.

During heavy tear-out and lifting work, the resistance acting on the hydraulic system rises. At this point, the alternating pump switches off automatically and the main pump alone will supply a reduced oil flow-rate of 161 l/min. The system pressure rises to a maximum of 210 bar, and the entire power will be transferred to the bucket or is made available to the transmission for powerful traction into the material.

Power reversal via Z-kinematics.

The Z-kinematics are characterised by a high tear-out force and fast bucket discharge. This is achieved by power reversal of the tilt ram. When filling the bucket (tear-out) the oil pressure acts on the large piston surface whereas it acts on the smaller differential surface of the piston during the dumping process. This empties the bucket extremely rapidly and largely prevents the adhesion of cohesive materials. Due to the double-sealed bearing-joints, extremely long maintenance intervals are also achieved.

Rigid and torsion-free frame.

The frame is very rigid due to the large dimensions between joints. This grants maximum strength to the overall construction and reduces the load on the articulated joint. The 40° turning angle gives the machine its extremely high manoeuvrability.



FAST

**Automatic Power-Speed-System.
The "intelligent brain".**

**POWERFUL WHEN
DIGGING**



Efficiency – by the press of a button.

The operator adapts the wheel loader to each operation by button pressure. Ergonomically integrated into the instrument panel all important main components such as engine, transmission and hydraulic system are adjusted optimally to the wishes of the operator and the requirements of the job.

Selected modes

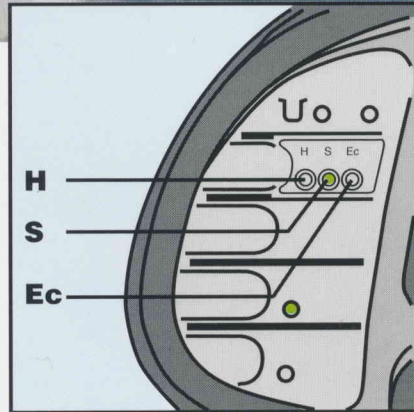
High:

Powerful for fast V-shape loading, for example for the loading of trucks. The APS 2-stage hydraulic system and a maximum engine rpm guarantee fast hydraulic cycle times. The "late" gear shift from the 2nd to the 3rd gear ensures the maximum tractive power and fast loading and dumping sequences.

This mode should be selected when maximum performance is required.

Standard:

Smooth for road travel as well as slow V-shape loading and "load & carry". The "early" gear shift reduces engine rpm and fuel consumption. The permanent disconnection of the switch pump reduces hydraulic loss and therefore fuel consumption. The reduced engine speed at "load & carry" means reduced engine wear and a reduction of noise level. The maximized engine rpm guarantees fast travel speed on the road.



Powerful, smooth or efficient – make your own choice.

Economy:

Efficient for Load & Carry and light duty job applications. This selected mode provides lowest operating costs and highest efficiency. Further to the adaptations carried out to the transmission and hydraulic systems the engi-

ne management is controlled. The reduction of the engine rpm effected with this selected mode leads to a further reduction of fuel consumption when accelerating.



To steer with the little finger.

A further innovative feature is the optional joy stick. Integrated into the arm of the operator's seat it provides the operator easy and low effort steering during reversing in a loading operation. "To steer with the little finger" saves a thousand turns of the steering wheel every day and keeps the operator fit.

You can read below what the WA320-3 drive unit has to offer. But it would be better if you experienced it yourself.

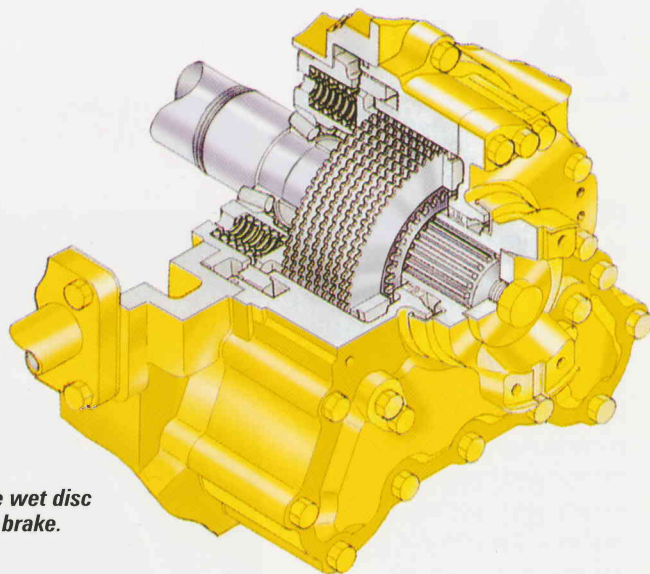
Maximum performance calls for rigidity.

A wheel loader is subject to extreme conditions because it has to cope with a wide variety of jobs: Driving from site to site, reversing, lifting and breaking, dozing earth loads etc. The machine is under incredible stress, from the axle right down to the smallest bolt. That is why the WA320-3 - like all the other wheel loaders in the new WA-3 active-plus series - has a

"sturdy" constitution. And constructive features that make these machines exceedingly robust.

Under pressure it feels at its best.

The double-sealed bucket bolts and the KOMATSU heavy-duty axles easily handle any load. The large-volume low-emission engine by KOMATSU keeps everything moving under power. With impressive results.



Multiple wet disc parking brake.



124 kW/168 hp - a really powerful, modern low-emission engine.

The large-volume KOMATSU 6-cylinder engine with turbo-charger gives the WA320-3 exceptional smoothness, flexibility and high torque. This gives you the power reserves you need whether in mining, in sand or in recycling. Very moderate fuel consumption and excellent combustion are significant factors for

economy and resolute environmental awareness. And easily accessible service points for easy maintenance go without saying.

Multiple wet disc parking brake.

Designed as multiple wet disc type, oil-immersed and integrated in the transmission case, also the parking brake prevents wear and makes it maintenance-free. Further-

more, the double disc service brake is an oil-immersed type and protected against mud and dust. The brake system is fully hydraulic giving a further step towards a maintenance-free machine.

Central lubrication factory fitted.

The optional KOMATSU-central lubrication system in the particularly robust heavy-duty design provides clean maintenance and low down time even in the heaviest operations.

Making sure the wheels always grip.

TPD (torque proportional differentials) or optional front and rear locking differentials are the guarantee for a good traction at all times, even on soft ground, for heavy pushing work, or on slopes.

Into gear smoothly.

There are four gears each for forward and reverse drive. The gear ratios are practise-related and provide jerk-free gear-change and reversing even under full load. The automatic transmission is particularly advantageous and takes the burden off the operator, as does the "kick-down", for changing down to first gear in a flash in order to move into the material at full power. Furthermore the

Exhaust limit values in g/kWh in accordance with ISO 8178

9,2	0,7	1,3	5,0
8,44	0,28	0,38	0,74
NO _x	PM	HC	CO

EC limit values
Actual values of the WA320-3 active plus

novel AMS-system provides optimized gear shifts and increased efficiency.

In harmony with the environment - not only due to the low exhaust values.

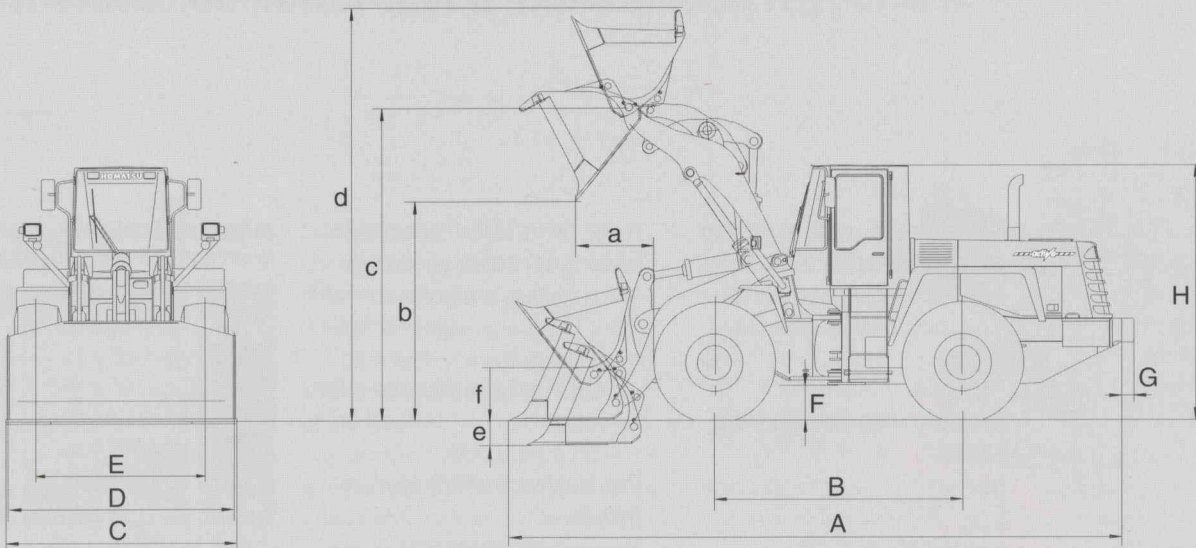
We hardly think it worth mentioning that our low-emission engines range far below the future European and international exhaust directives. The high-pressure injection plus a modified turbocharger give the wheel loader low-noise force and staying power. The hydraulic system operates optionally with bio-oil and is thus in perfect harmony with the environment, for instance in water-protected areas. Taken altogether - an investment which pays for itself in the shortest of time.



Easily accessible service points from the ground for cab filter, engine and transmission make service work simple and clean.



Dimensions and operating data.



Buckets (capacities according to ISO 7546)	m ³	2.6	2.9
Specific density	t/m ³	1.75	1.55
Bucket weight with teeth	kg	1.225	1.310
Static tipping load (straight)	kg	11.140	11.110
Static tipping load (at a 40° angle)	kg	9.570	9.530
Breakout force, hydraulic	kN	126	123,6
Hydraulic lifting capacity, on ground	kN	144	143
Operating weight**	kg	13.950	14.035
a Reach at 45°	mm	1.063	1.067
b Dumping height at 45°	mm	2.868	2.843
c Lift height, hinge pin	mm	3.877	3.877
d Height to upper edge of bucket	mm	5.226	5.226
e Digging depth (at 0°)	mm	63	63
f Bucket height when travelling	mm	390	390
A Overall length	mm	7.357	7.376
B Wheelbase	mm	3.030	3.030
C Bucket width	mm	2.740	2.740
D Width across tires	mm	2.577	2.577
E Track	mm	2.050	2.050
F Ground clearance	mm	375	375
H Overall height	mm	3.320	3.320

Special buckets:
3.8 m³ light material buckets

The standard 2.6/2.9 m³ buckets shown in the table are also available with bolt-on cutting edges to increase capacities to 2.7/3.0 m³.

Data will be modified according to:

	Additional counter-weight	Tire filling
Weight	+ 325 kg	+850 kg
Dump load:		
0°	+ 865 kg	+ 1345 kg
40°	+ 725 kg	+ 1180 kg
Overall length (G)	+ 175 mm	-

L_pA = 73 dB(A)*
L_wA = 107 dB(A)*

* in accordance with 95/27/EC (new dynamic measurement)

** machine without additional counterweight

These values refer to a machine fitted with 20.5 R 25 L-3 XHA tires.

Bucket type	Capacities in m ³	
Earth bucket	2.6	
Bucket	2.7	
Bulk mat. bucket	2.9	
Bulk mat. bucket	3.0	
Light mat. bucket	3.8	
Density	in (t/m ³)	0,9 1,0 1,1 1,2 1,3 1,4 1,5 1,6 1,7 1,8 1,9 2,0

The actual volume will usually exceed the ISO/SAE classification. The table shows optimum bucket data, depending on the material involved.

Material	Bucket contents %	Density t/m ³
Earth	100-115	1.5-1.6
Clay	110-120	1.5-1.7
Sand	100-110	1.4-1.8
Gravel	85-110	1.5-2.0
Rock	75-100	1.6-2.0

not-economical recommended full utilisation

(Special bucket sizes available upon request)

Technical data at a glance.



Engine

Make	KOMATSU low-emission engine
Model	S6D114 E-1
Type	Turbo diesel engine
Power output at engine speed	124 kW/168 hp (ISO 9249) 2,350 rpm
Max. torque	671 Nm at 1,500 rpm
No. of cylinders	6
Bore/stroke	114/135 mm
Displacement	8270 ccm
Compression ratio	17.1 : 1
Fuel injection	direct
Cooling system	dual-circuit, thermostatically controlled liquid cooling
Electrical system	24 Volt
Battery	2 x 12 Volt, 143 amp/h
Alternator	50 amp/h
Air filter	HD dry-air filter FITG II-8268



Transmission

Make	KOMATSU
Type	Fully-automatic 4-speed full power shift transmission with "kick-down" and "gear-hold"
Conversion ratio	3.15 : 1



Steering

Type	hydrostatic
System	articulated
Articulated joint	needs no readjustment
Steering angle	40° each side
Steering pump	
operating pressure delivery	210 bar 70 l/min
Minimum turning radius	
outside edge, wheel	5,535 mm
outside edge, standard bucket	6,040 mm
Emergency steering	via additional pump



Filling capacities

Fuel	221 l
Engine oil	20.4 l
Cooling System	30 l
Converter transmission/ power shift transmission	60 l
Front axle	25 l
Rear axle	25 l
Operating hydraulics/brake system	165 l



Hydraulic system

System	2-stage, two-pump system with main and switch pump
Operating pressure	
stage 1	160 bar
stage 2	210 bar
Operating flow	
stage 1	237 l
stage 2	161 l
Loading times	
lift (Full load)	5.1 sec.
dump	1.5 sec.
lower	3.0 sec.
Automatic boom-kick-out, automatic return-to-dig	



Axles

System	All-wheel drive, planetary reduction in the axle housing
Front axle	HD axle with self-locking differen- tial, 45 % locking value
Rear axle	HD axle with self-locking differential, oscillating, 45 % locking value
Oscillating angle	15° each side
Tires	20.5 R 25 XHA L3, Michelin 555/70 R 25 XLD 70 L-3, Michelin 20.5 R 25 VLT, L2/3, Bridgestone 20.5 R 25 SPT 7 LD, L3, Dunlop 20.5 25 PG 6S, 12 PR, L3, Dunlop 20.5 R 25 XTLA, L2, Michelin 20.5 R 25 XRD 1A, L4, Michelin 20.5 R 25 XLD D 2A, L5, Michelin 20.5 R 25 RL-2+, L2, Goodyear 20.5 R 25 GP 2B, L2 Goodyear 20.5 R 25 GP 4B, L4 Goodyear



Travel speeds

Forward	1st gear 0 -	7.4 km/h
	2nd gear 0 -	11.6 km/h
	3rd gear 0 -	20.9 km/h
	4th gear 0 -	37.6 km/h
Reverse	1st gear 0 -	7.8 km/h
	2nd gear 0 -	12.3 km/h
	3rd gear 0 -	22.9 km/h
	4th gear 0 -	39.3 km/h



Brakes

Operating brakes	Hydraulic pump accumulator brake system, oil-bath multiple disc brakes (in axle housing)
Hand brake	Oil-bath multi-disc brake in transmission case, spring-loaded, opening hydraulically



Standard equipment

Low-emission engine • Noise-insulated high-comfort cab (equipped with ROPS/FOPS) • air conditioning • air suspension operator's seat • openable door windows • stereo cassette radio • 2 halogen main lights • halogen work lights, each front and rear • vandalism protection • AMS Application Mode Selection (H, S, Ec selected mode) • automatic transmission with additional kick-down and gear-hold • two-lever hydraulic operation • emergency steering • electronic checking system (EDIMOS II) • automatic power-speed hydraulic system (APS system) • automatic return-to-dig • automatic boom-kickout • 20.5 x 25 radial tires • all loading kinematics and bearing points sealed • integrated noise insulation • German federal motor vehicle safety standards (StVZO).

The WA320-3 is equipped in accordance with the professional safety regulations and fulfils the low-emission directives of ISO 6393 and the directive 95/27/EC.

Noise emissions: L_{WA} 107 dB(A), L_{pA} 73 dB(A).



Optional equipment

High-lift attachment • fold-down radiator grill • self-locking differentials in front and rear axle • 3-spool-valve • single-lever hydraulic control • multi function lever for transmission and hydraulic control • weighing facility • backup alarm • additional counterweight (325 kg) • additional counter weight II (460 kg) • central lubrication • special colour • rock and special buckets • special tires (e.g. rock, recycling, sand, clay, etc.) • tire chains • protective grill for windscreen • catalyst • speed limitation • TURBO II air-pre-cleaner • handrails for working in a quarry • travel lock • hydraulic quick coupler • equipment for the wood industry (log grapple, light material- and high tip bucket) • additional working lights • roof railing • 3rd and/or 4th spool valves for additional hydraulic functions • heated operator's seat.

WA 320-3 *active plus* All highlights at a glance.

APS: the Automatic Power Speed system matches the hydraulic operating data to the actual conditions. "Fast" for short loading cycles. "Power" when moving right into the material.

AMS: The Application Mode System enables the operator to adjust the machine optimally to each operation requirements. Highest efficiency and lowest fuel consumption are therefore guaranteed.

Driving functions and control data are monitor-displayed in the operator's field view and easy to check by the service staff using the memory function.

Powerful low-emission engine: Komatsu S6D114E. 124 kW/168 hp (ISO 9249). Fulfills all future exhaust and noise regulations. $L_{wA} = 107$ dB(A) (95/27/EC)

ALS-Electronic: Absorbs vibrations and protects operator and machine according to load and speed (optional).

Spacious operator's cab on hydrobearings. Low noise level of $L_{pA} = 73$ dB(A) (95/27/EC).

Locking differentials for better traction with a locking value of 45% (option), or TPD differentials (standard).

Fully-automatic transmission with electrical "kick-down" and "gear-hold".

Fully enclosed multiple wet-disc parking brake, integrated into the transmission and maintenance free.

Sturdy KOMATSU axles for all operations. They ensure a long machine life.

Optimum rear design for excellent all-round view and easy stockpiling.

KOMATSU wheel loaders: The best of both worlds.

Wheel loaders of the WA 3-series were the first products developed and built in Hanover for Europe. The new *active plus* series is the logical further development of this successful series.

Apart from the construction of wheel loaders, the plant in Hanover is also specialized in the design and fabrication of waste compactors, axles and transmissions.

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VESS074502

Print: 03/00. All data subject to modification at any time.
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Printed in Germany