

# HANOMAG

**NEW**

## Wheel Loader 60 E

132 kW/177 SAE net hp

Bucket capacity: 2.6-5.0 m<sup>3</sup>

Operating weight: 16150 kg

- 6-cylinder HANOMAG diesel engine, model D 964 T — 10,809 cc displacement
- Minimum fuel consumption
- HANOMAG torque converter and full powershift transmission with electric twin-lever control
- All-wheel drive with internal multi-disc brakes, self-locking differentials and planetary reduction gears
- Disengaged front axle drive (optional)
- Automatic two-stage hydraulics
- Long wheelbase: 3200 mm
- Static tipping load: 11700/10600 kg  
23.5-25 tyres (20.5-25 tyres optional)
- „Centronic“ — central electronic checking, warning and safety system
- ALS (Automatic Load Stabilizer) optional



# Wheel Loader 60 E



## Engine

Make	HANOMAG
Model	D 964 T
Type	Diesel
Power rating at 2200 rpm	132 kW/177 hp SAE net* 170 kW/230 PS (DIN 70020)

Max. torque ratings at 1400 rpm (DIN 70020)	700 Nm
No. of cylinders	6
Bore	128 mm
Stroke	140 mm
Displacement	10809 cm <sup>3</sup>
Compression ratio	17.2 to 1
Fuel injection	Direct
Cooling system	Dual circuit, thermostatically controlled liquid cooling

Electrical system	24 volts
Batteries	2 x 12 v., 110 amp. h. (DIN)
Threephase alternator	35 amp.
Air cleaner	Heavy-duty, dry type, with aspirator

\* Net horsepower at flywheel of engine operating under ambient conditions of 29 °C and 748 mm Hg., equipped with fan, air cleaner, truffle, water, oil and fuel injection pumps, and alternator not charging.



## Transmission

Converter transmission	HANOMAG G 522-4 with single stage torque converter
Conversion ratio	3.4 to 1
Shift transmission	HANOMAG G 423-1 full powershift
Speeds	4 forward/4 reverse



## Travel speeds

Work speeds (max.)	
forward	1. gear 0 — 5.9 km/h 2. gear 0 — 11.3 km/h 3. gear 0 — 20.0 km/h 4. gear 0 — 38.3 km/h
reverse	1. gear 0 — 6.3 km/h 2. gear 0 — 11.9 km/h 3. gear 0 — 21.6 km/h 4. gear 0 — 40.3 km/h



## Axles

System	Four wheel drive with planetary reduction gears in each wheel hub
Front axle*	Planetary axle with multi-disc self locking differential
Rear axle	Planetary axle with multi-disc self locking differential, oscillating 45 °
Locking action	24 °
Oscillating angle, max.	23.5 — 25 EM 16 PR
Tyres	20.5 — 25 EM 16 PR
Tyre chains	only with 20.5-25 tyres

\* = disengaged front axle drive (optional)



## Brakes

Service brake	Hydraulic pump accumulator brake system, internal, wet-type multi-disk brakes (all-wheel brake system)
Parking brake	Mechanical, disc type on drive shaft



## Steering

System	Articulated steering
Type	Hydrostatic steering with load-controlled flow divider
Articulated joint	No adjustment required
Steering angle lock	40 °
Steering pump	
Operating pressure	180 bar
Output	195 l/min
Minimum turning radius	
Outside edge wheels	5960 mm
Outside edge bucket	6535 mm
Emergency steering	Via additional pump



## Hydraulic system

System	Fully closed, two stage hydraulic, two-pump system with main and shut-off pump
Loader operating pressure	
Stage 1/Stage 2	140 bar/220 bar
Loader operating flow	
Stage 1/Stage 2	345 l/195 l
Cycle times (rated bucket load)	
Roll back/Dump	1.2 s/1.3 s
Lift/Lower	5.3 s/3.8 s
Automatic lift/shutoff, bucket position indicator.	



## Capacities

Fuel tank	390 l
Engine oil	22 l
Cooling system	49 l
Converter transmission	16 l
Powershift transmission	19 l
Front axle	28 l
Rear axle	24 l
Hydraulic system	160 l



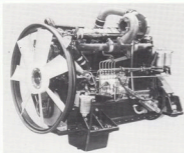
## Standard Equipment

2 halogen main lights, 2 halogen working lights front and rear, 2 indicator lights, 2 combined brake-indicator-rear lights, number plate lighting, 2 side lights for bucket blade guard.  
Multi-adjustable comfortable operator's seat, seatbelt.  
Hourmeter, speedometer, engine coolant temperature gauge, fuel level indicator, horn.  
„Centronic“ — central electronic checking, warning and safety system.



## Optional Equipment

Twin-door noise-protected ROPS cab to DIN/ISO, tinted laminated glazing, sun protecting blind, window door windows, opening-up roof ventilation, adjustable heater with fan, FOPS, automatic return-to-dig, 3rd control circuit, log clamp, forklift, cold start, hydraulic quick-attach adaptor, radio with earphones.



▲ HANOMAG six cylinder turbocharged diesel engine with direct injection. The right engine for construction machinery with high displacement and enormous power reserves.

#### Compact yet powerful construction machinery engine

Power is provided by the new high-volume 6-cylinder turbocharged diesel, further developed and built by HANOMAG.

Displacement: 10809 cc, rating: 132 kW/177 SAE net hp. Characteristic advantages of this construction machinery engine: ample power reserves, responsive torque, favourable torque rise across a broad engine rpm, full power at less than rated engine rpm, extremely smooth, quiet running. A depression in the piston head ensures highly intensive airfuel swirl on the compression strokes.

The outcome: excellent combustion, low fuel consumption and therefore less exhaust emission.



▲ Maintenance points are clearly and easily accessible.

Unrestricted accessibility to all maintenance areas ensures swift and straightforward engine and component servicing.

#### Modern, compact torque converter transmission

The HANOMAG designed torque converter transmission G 522-4 is built and assembled according to progressive manufacturing techniques. The conversion ratio is 3.4:1.

#### Proven full powershift transmission

Original HANOMAG design which has proven itself daily in thousands of construction machines. Four speeds forward and reverse; perfectly spaced, smoothly shifting even under full load.

Large, pressure-lubricated multi-disc clutches and microfiltration of the hydraulic oil are an assurance of good durability. Constant mesh gears reduce operating noise.

An easily accessible check centre allows converter and powershift transmission pressures to be measured at all times. Important for good reliability.

#### Rugged construction machinery axles

The heavy-duty drive axles feature planetary gear reduction. As the reduction units are mounted in the wheel hubs, in other words where maximum torque is required, pre-mounted elements like the floating axles and differential are less exposed to torsional forces. The result is improved durability. The rear axle oscillates at an angle of 24°. This allows obstacles to be negotiated without the tyres losing contact with the ground.



▲ Ground clearance 464 mm

#### Self-locking differentials

HANOMAG wheel loaders are equipped standard with front and rear multi-disc self-locking differentials. This ensures substantially improved performance for heavy-duty pushing work or when

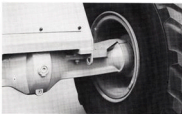
loading on slopes. The locking action (45 %) results automatically through two multi-disc packs mounted in the differential housing with load-conditioned expansion forces.

The locking action is automatically adjustable to changing engine torque and increased torque in the various gears.

#### **Integrated wet-type brake system**

**Service brakes:** hydraulic dual-circuit, pump accumulator brake system. Completely sealed, oil cooled, no adjustment necessary and virtually no wear on the multi-disc brakes. This is a safety brake ensuring reliable braking action even in the event of engine failure.

As the brake is mounted between the sun and ring gears of the planetary gear units, braking torque is kept very low for good durability. An additional crowd shut-off valve disconnects power to the transmission when the engine is in gear and the brake is applied. This valve can be overridden by a



▲ Internal, wet-type multi-disc brakes

switch mounted on the instrument panel — for road travel, for instance.

**Parking brake:** generously dimensioned disc brake, manually operated and mounted in the universal joint shafing.

#### **Effortless steering**

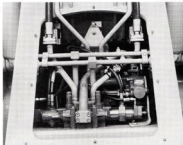
The 60 E features hydrostatic articulated steering with load-controlled flow division. The main hydraulic pump delivers a constant flow of oil which is allocated when the steering wheel is applied. Priority flow goes to the steering system and is proportional to the speed of steering. In the event of pump failure, a mechanically driven emergency steering pump is automatically switched on. At the same time, the „Centronic“ system provides visual and acoustic warning for the operator in his cab.

#### **Modern two-stage hydraulics**

The sensitively controllable loader hydraulic system is operated by a single pilot-controlled lever. This is a completely sealed, sensibly stepped system with automatic control. It adapts automatically to job conditions.

If the situation allows fast travel, the main and shut-off pump together develop up to 140 bar for the lift and dump circuits.

For heavy-duty ripping and lifting where resistance exceeds this level, the shut-off pump is automatically disconnected. The main pump then develops by itself up to 220 bar system pressure.



▲ Spool valve readily accessible, integrated in front frame

#### **Sturdy loader linkage with cross-over geometry**

The loader bearings are sealed for long service intervals.

Generous roll back and dump angles at all lift heights are characteristic of the cross-over loader geometry.

High dump height and wide reach of loading arm. Cross-over loader geometry makes maximum use of two-stage hydraulics.

When digging and rolling back the bucket, tremendous forces develop as oil pressure in the tilt cylinder acts on the head end of the cylinder.

When dumping, on the other hand, oil pressure acts upon the small, rod surface. Power reversal gives bucket emptying for high-speed work cycles.

The ALS-system will engage automatically when a working speed of more than 5 km/h is attained. With ALS there is no loss of material, no shocks or stresses to the 60 E and operator (ALS is optional).



▲ Operator cockpit with all-glass doors: spacious and ergonomically designed



▲ Electronic twin-lever control

### Spacious, highly comfortable cab with ROPS/FOPS and outstanding noise insulation

Long before stipulated by legislation, ROPS has been a standard feature on HANOMAG wheel loaders. Long-standing site experience is mirrored in state-of-the-art safety engineering and ergonomics.

The spacious and comfortable safety cab with the all-glass doors ensures optimum allround visibility for the operator. The cab in fact is big enough to accommodate two persons.

The operator's compartment is quickly and conveniently accessible from either side through wide opening doors. The hydraulically cushioned highly comfortable seat can be adjusted to suit the height and weight of the operator.

The hydraulic servo-control of the working hydraulics, the adjustable steering column, the light smooth running hydraulic steering and the electric twin-lever gear shifting arrangement ensure safety and effortless work.

One finger-tip contact for forwards and reverse drive, the other for gears 1 to 4. With a safety lever on the steering column it is possible to arrange the control for work, drive and neutral safety start.

The operator has a complete view of orderly layout of instruments in the fully insulated dashboard. The most important machine functions and the working condition of the wheeled loader such as battery charging, air filter, steering circuit pressure, service brake, parking brake, coolant temperature, water level, engine oil pressure, converter temperature and transmission charging pressure are constantly monitored and protected through a



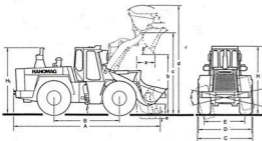
▲ "Centronic" — central electronic checking, warning and safety system

central control and warning system ("Centronic"). We know this is a great relief to any operator.

Electric front and rear windscreen wipers and washers provide good visibility whatever the weather.

The 60 E, even in its standard version, is exceptionally quiet. Its noise-level lies far below the requirements set by the latest EC-regulations (ISO) 6393 (EC guideline 86/622).

# Wheel Loader 60 E



Specifications according to SAE J 732 C with 23.5-25 EM L2 tyres and ROPS.

Illustrations, dimensions, weights, specifications, design features subject to change without notice.



## Measurements

Buckets	m <sup>3</sup>	2.6*	2.6 HD	2.8	3.0	3.8	5.0
A Overall length	mm	7800	7905	7800	7900	8000	8100
B Wheelbase	mm	3200	3200	3200	3200	3200	3200
C Bucket width	mm	2500	2750	2750	2750	3000	3000
D Width less bucket	mm	2500	2655	2655	2655	2655	2655
E Gauge	mm	1930	1992	1992	1922	1922	1922
F Ground clearance	mm	410	464	464	464	464	464
H Overall height	mm	3315	3370	3370	3370	3370	3370
H <sub>i</sub> Exhaust height	mm	3015	3070	3070	3070	3070	3070
a Reach at full lift, 45° discharge	mm	1107	1135	1040	1110	1145	1220
b Dump clearance, 45° discharge	mm	2950	2910	3005	2935	2825	2755
c Lift height, hinge pin	mm	3985	4040	4040	4040	4040	4040
d Overall lift height	mm	5280	5300	5325	5325	5500	5800
e Dig below ground level, 0° dump	mm	86	140	140	140	190	190
f Carry height, hinge pin	mm	500	500	500	500	500	500
α Rollback, carry	°	53	53	53	53	53	53
β Dump, full height	°	50	50	50	50	50	50
γ Rollback, full height	°	58	58	58	58	58	58
δ Oscillation	°	30	24	24	24	24	24



## Operating data

Buckets	m <sup>3</sup>	2.6*	2.6 HD	2.8	3.0	3.8	5.0
Specific gravity	to/m <sup>3</sup>	2.0	2.0	1.8	1.7	1.3	1.0
Stating tipping load, straight	kg	11800	11600	11700	11800	11400	11100
Stating tipping load, articulated	kg	10700	10500	10600	10500	10300	10000
Breakout force	kN	155	138	155	142	131	121
Lifting capacity	kN	164	164	164	164	164	164
Bucket weight incl. teeth	kg	1410	1620	1530	1600	1800	2100
Operating weight	kg	15600	16250	16150	16200	16400	16700

\* = Only with 20.5-25 tyres (optional)

## HANOMAG

HANOMAG  
Aktiengesellschaft  
Hanomagstr. 9  
Postfach 91 1325  
D-3000 Hannover 91  
Tel. (5 11) 45 09-0  
Telex 922275  
Telefax (5 11) 45 09 185

TD 108896-02