

BE1000-1

HYDRAULIC EXCAVATOR



- Efficient Hydraulic System
- Closed loop swing system
- Aesthetically improved cabin
- Optimized service & Maintainability index
- Powerful, Economical Engine
- Effort-free operation
- Maximum Working Performance
- High Total Reliability and Durability
- Easy Maintenance
- Operator Comfort

BACKHOE

Flywheel Horsepower : 404 kW (542 hp) @ 1700 rpm

Operating mass : 95000 kg

Bucket capacity : 3.1 m³ - 5.55 m³

LOADING SHOVEL

Flywheel Horsepower : 404 kW (542 hp) @ 1700 rpm

Operating mass : 98000 kg

Bucket capacity : 4.5 m³ - 7.0 m³



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BE1000-1 HYDRAULIC EXCAVATOR

Salient Features :

Efficient Hydraulic System for increased Productivity :

Three pump hydraulic system with independent closed loop swing function not only assures smooth compound work equipment movements and travel but also shortens the cycle time.

Powerful economical engine :

BEML diesel engine delivers 404 kW (542 fhp). A direct injection system for reduced fuel consumption and assures high operational economy. The turbo charger allows engine to attain high performance even on high altitude job sites.

Effort free operation :

Work equipment controls are simple and light touch due to the hydraulically assisted control system.

Maximum working performance :

Wide working range and large undercarriage assures stable operation for maximum working performance.

Easy maintenance :

Centralised monitoring system within the operator's cab allows fast daily checks and also keeps the operator constantly informed of any abnormality during operation. Operator comfort : Specially designed cab provides plenty of work space and excellent visibility.

Minimum downtime :

Automatic lubrication system supplies optimum amount of grease to vital hinge pins and swing circle bearings reducing failures and downtime.

Safety :

Automatic fire detection and suppression system prevents fire accidents and hence minimizes loss of valuable resources.



ENGINE

BEML BSA6D170-1, 4 cycle, water cooled, overhead valve, direct injection, turbocharged, diesel engine with after cooler. Six cylinders of 170 mm bore x 170 mm stroke and 23.15 l piston displacement.

Flywheel horse power : 404 kW (542 hp) @ 1700 rpm. All speed control mechanical governor. Gear pump driven forced lubrication with full flow filter. Dry type air cleaner with an automatic dust evacuator for longer element service intervals and a dust indicator for simplified maintenance. 24 Volt electrical starting system.



HYDRAULIC SYSTEM

Unique three-pump system and independent closed loop swing function assure smooth compound movements of the work equipment. The hydraulic system is proportional positive flow control system for implement circuit and closed loop swing system for swing circuit with electronic load limiting control for all three pumps for efficient use of engine power. This system also reduces hydraulic loss during operation, resulting in lower fuel consumption. Oil to air hydraulic oil cooler maintains optimum heat balance of hydraulic oil.

Hydraulic pumps

- Two variable-capacity tandem pumps power the boom, arm, bucket and travel circuits.
Capacity (discharge flow) at rated r/min - 2x628 l/min
- One variable-capacity piston pump powers the swing closed loop circuit.
Capacity (discharge flow) at rated r/min - 1 x 405 l/min
- Tandem gear pump powers the pilot + PTO lub circuit.
Capacity (discharge flow) at rated rpm - 1 x (49+24.5) l/min

Hydraulic Motors :

Travel : Four variable displacement axial piston motors with built-in counter balance valve for overrun protection and an externally fitted mechanical parking brake of spring applied and hydraulically released wet multiple disc type for braking. (Two for each track)

Swing : Two fixed displacement axial piston motors with flushing valves for closed loop swing system and an externally fitted swing holding brake of spring applied and hydraulically released wet multiple disc type.

Control Valves : High flow capacity eight spool type two numbers for minimum pressure drop for rated flow.

Relief valve settings

Implement circuits	: 31.39 MPa (320 kg/cm ²)
Travel circuits	: 31.39 MPa (320 kg/cm ²)
Swing circuits	: 29.43 MPa (300 kg/cm ²)
Pilot circuits	: 3.43 MPa (35 kg/cm ²)

Hydraulic cylinders : (backhoe)

Cylinder	Numbers	Bore x Stroke (in mm)
Boom	2	225 x 2200
Arm	1	250 x 2015
Bucket	1	225 x 1630

Hydraulic cylinders : (Loading shovel)

Cylinder	Numbers	Bore x stroke (in mm)
Boom	2	225 x 1805
Arm	2	180 x 1765
Bucket	2	200 x 1530
Bottom dump	2	140 x 435



STANDARD EQUIPMENT

2 x 24 V/7.5 kW starting motor, 24 V/100 A alternator, 2 x 12 V / 200 Ah batteries, Air cleaner, Dust indicator, Two modes selection with electronic load limiting control, Track roller guards, Wet disc parking brake, Vandalism Protection, Swing holding brake, Tool box, High mount steel cab, including tinted glass window, Reclining seat, Magazine box, Ash tray, Rubber mat, Rear view mirror, Cabin fan wind shield wiper, Portable fire extinguisher and Cabin lamp, Counter weight, Automatic lubrication system, Warning cluster

INDICATORS / ALARMS

Radiator coolant level, Engine oil level, Hydraulic oil level, Engine cooling water temperature, Engine pre-heating, Hydraulic oil Filter clogging

GAUGES & METERS

Fuel level gauge, Engine oil pressure gauge, Engine cooling water temperature, Hydraulic oil level & temperature gauge, Service Meter

OPTIONAL ACCESSORIES

Low mount steel cab, Heater, Air conditioner, Seat belt, Falling object protective structure (FOPS), Track shoe - 810 mm and 1010 mm, Front Wind shield guard, Automatic fire suppression system, Wind shield washer



STEERING

Type: Steering / travel controls are actuated with either hand levers or foot pedals. Pushing both levers (or pedals) makes the machine to move forward. Pulling them back makes the machine to move backward. Steering one lever (or pedal) in neutral and the other in forward enables the machine to make a pivot turn. Pushing one forward while pulling the other backward makes the machine counter-rotate on the spot.



DRIVES

Type Fully hydrostatic drive system is with two speeds. Each track is driven by two hydraulic motors. Power is transmitted through spur gears and planetary reduction gears to the track.

Max. Drawbar pull : 608 kN (62,000 kgf)

Max. travel speeds

High : 0.94 m/sec (3.4 km/h)

Low : 0.67 m/sec (2.4 km/h)



BRAKES

Hydraulic lock type brakes. Each travel motor is equipped with an externally fitted brake of spring applied and hydraulically released wet disc type. When the travel/steering levers are positioned in neutral, the brake is automatically applied. When the brakes are applied, the hydrostatic braking softens shocks and also serves to regulate speeds when making descent. Wet, multiple disc type parking brakes which are hydraulically interconnected with travel/steering levers are also automatically actuated on the final-drive shaft.



SWING SYSTEM

Two fixed displacement piston motors power the closed loop swing system through two swing machineries with spur and planetary reduction gears. An externally fitted wet multiple disc type swing holding brake in the swing motor is automatically applied after 3.5-4.0 sec. when the control lever is positioned in neutral, with swing in Auto mode and always release in release mode and applied always when parking brake is in ON. Single-row shear type ball bearings with induction hardened internal gears are built-in in the swing circle.

Swing speed

4.5 r/min

Tail Swing radius

4650 mm



UNDER CARRIAGE

Job proven undercarriage with long track and wide track gauge. Centre frame is mounted on the track frames and secured with bolts. Sealed and lubricated rollers and idlers. Hydraulic track tension adjusters with cushion cylinders. Assembled track-type shoes with double grousers

Shoe width : 710 mm

Grouser height : 20 mm

No. of shoes (each side) : 51

No. of track rollers (each side) : 8

No. of carrier rollers (each side) : 3

Ground pressure (Backhoe) : 120.00 kPa (1.22 kg/cm²)

Ground pressure (Loading shovel) : 123.56 kPa (1.26 kg/cm²)



OPERATING MASS (approx.)

Loading Shovel :

Operating mass including 5100 mm boom, 3800 mm arm, 6.1 m³ standard bucket, operator, lubricant, coolant, full fuel tank and the standard accessories.98,0000 kg.

Backhoe :

Operating mass including 9250 mm boom, 3415 mm, arm 4.3m³ standard bucket operator, operator, lubricant, coolant, full fuel tank and the standard accessories 95,0000 kg.



BUCKET RANGE

EXCAVATOR	Loading Shovel				Backhoe					
Bucket Capacity m³										
Heaped (SAE/ISO)	4.5	5.5	6.1	7.0	3.1	3.7	4.3	5.0	5.4	5.55
Struck	3.6	4.1	4.7	5.6	2.3	2.7	3.2	3.6	4.2	4.5
Bucket width (mm)										
Without side cutters	2320	2410	2650	2650	1410	1700	1890	2085	2100	1940
With side cutters					1580	1870	2060	2255	2270	----
Bucket mass (with teeth in kg)										
Without side cutters	6450	8250	8350	8650	3100	3600	3800	3911	4350	5270
With Side cutters					3300	3800	4000	4111	4550	----
No. of bucket teeth	6	6	6	6	4	4	5	5	5	5
Bucket type & uses	Bottom dump Material with density around 2.5t/m ³	Bottom dump Rock	Bottom dump Standard Heavy duty	Bottom dump Light material	Narrow	Narrow	Standard heavy duty	Light duty	wide	coal

Material and specifications are subject to change without notice, Illustrations may include optional equipment & accessories



SERVICE REFILL CAPACITY

Fuel tank	: 1140 ℓ
Coolant	: 158 ℓ
Engine	: 51 ℓ
Final Drive (each side)	: 55 ℓ
Swing drive (each side)	: 13 ℓ
Hydraulic Tank	: 650 ℓ
Pump Drive (P.T.O.)	: 15 ℓ
Total Hydraulic System	: 1200 ℓ



FILTER SYSTEMS

Engine : Two stage fuel filter with water separator.

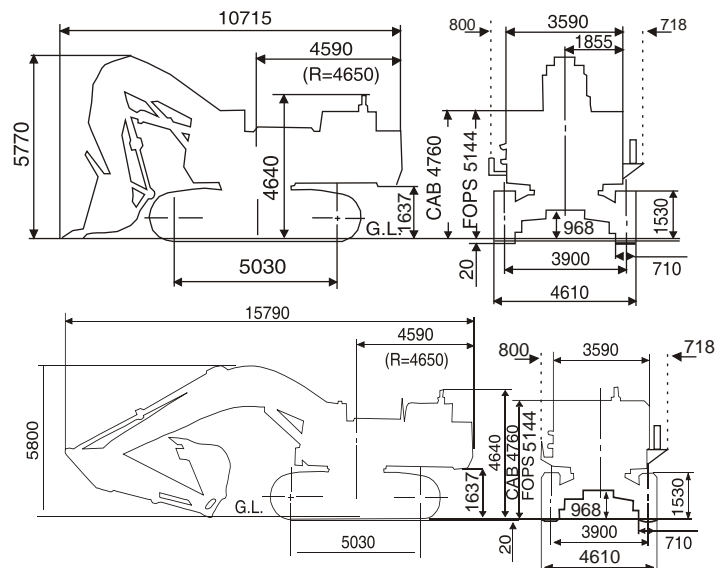
Air intake : Dry type, two stage air cleaner with dust evacuator.

Hydraulic : One suction filter, four pressure line filters, four main, return line filters and one for motor drain filter, one filter for pilot system, one for closed loop swing and one for PTO lubrication system.



WORKING RANGE

EXCAVATOR	Shovel (Fig.1)	Backhoe (Fig.2)			
Boom	5.1 m	7.9m Short	9.25m Std.		
Arm	3.8m	3.4m Std.	3.4m Std.	4.6m	5.7m Long
Bucket	6.1m ³				
A. Max. cutting / digging height (m)	12.170	12.7	13.4	13.1	13.80
B. Max. dumping height (m)	8.780	8.4	9.1	9.0	9.5
C. Max. digging depth (m)	3.910	7.9	9.3	10.4	11.5
D. Level crowding distance (m) / Max. vertical wall digging depth	4.720				
E. Max. digging reach at G.L. (m)	10.950	6.2	7.4	7.6	9.2
F. Max. digging reach (m)	11.380	13.5	15.0	15.9	17.00
G. Min. reach on ground / Max. digging depth of cut at 2.44 m level	6.125	7.8	9.16	10.3	11.40
H. Reach at max. dumping height	6.350				
I. Max. bucket throat opening	1.815				
Bucket digging force (kg)	56,000	37,000	37,000	37000	30500
Arm crowding force (kg)	58,500	34,000	34,000	29000	24500



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