

# BE1800E

## HYDRAULIC EXCAVATOR



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

### BACKHOE :

Gross Horsepower	: 2 X 300 kW @ 1500 r/min
Operating mass	: 170000 kg
Bucket capacity	: 10.5 m <sup>3</sup> - 12.0 m <sup>3</sup>

### LOADING SHOVEL :

Gross Horsepower	: 2 X 300 kW @ 1500 r/min
Operating mass	: 175000 kg
Bucket capacity	: 7.5 m <sup>3</sup> - 12.0 m <sup>3</sup>



# BE1800E 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 motor :

2x6.6 kV, 4 pole, 3 phase, 50 Hz TEFV squirrel cage induction motors delivers 2 x 300 kW to assure high operational economy.

### 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 assure stable operation for maximum working performance.

### Easy maintenance :

Centralised monitoring systems 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.

## MOTOR

Type	: Squirrel cage Induction motor
Out put	: 2 x 300 kW
Voltage	: 6.6 kV +/- 10%
Rated current	: 33 A each ( at 6.6 kV)
Frequency	: 50 Hz
Revolutions	: 1,500 rpm
Starting current	: 4.5 p.u (approx.)

- Custom made electric motor to withstand severe mining conditions.
- Power limit control by Pump Management System
- Note: The hydraulic specification of the electric-driven machine varies from the diesel driven version.

## HYDRAULIC SYSTEM

Unique four pump system and independent swing function assure smooth compound movements of the work equipment. Unique positive flow control system controls all pumps for efficient use of motor power. This system also reduces hydraulic loss during operation, resulting in low power consumption. Oil to air hydraulic oil cooler maintains optimum heat balance of the hydraulic oil.

### Hydraulic pumps

Four variable-capacity piston pumps power the boom, arm, bucket and travel circuits.

Capacity (discharge flow) at motor revolutions : 4 x 410 ℓ/min

Two variable capacity piston pumps power the swing circuit.

Capacity (discharge flow) at motor revolutions : 2 x 358 ℓ/min

### Hydraulic Motors :

**Travel :** Four axial piston motors with brake valve (Two for each track)

**Swing :** Two axial piston motors with swing holding brake.

**Control Valves :** Eight way spool type x 2

### Relief valve settings

Implement circuits : 31.4 MPa (320 kg/cm<sup>2</sup>)

Travel circuits : 31.4 MPa (320 kg/cm<sup>2</sup>)

Swing circuits : 31.4 MPa (320 kg/cm<sup>2</sup>)

Pilot circuits : 3.43 MPa (35 kg/cm<sup>2</sup>)

### Hydraulic cylinders (Backhoe) :

Cylinder	Number	Bore x Stroke
Boom	2	280 mm x 2660 mm
Arm	2	250 mm x 2180 mm
Bucket	2	200 mm x 2170 mm

### Hydraulic cylinders (Loading shovel) :

Cylinder	Number	Bore x Stroke
Boom	2	280 mm x 2110 mm
Arm	2	225 mm x 1830 mm
Bucket	2	225 mm x 1870 mm
Bottom dump	2	180 mm x 460 mm

## STEERING

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. Setting 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

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

Max. drawbar pull : 1030 kN (105000 kg)

Max. travel speed : 0.75 m/s (2.7 km/h)

## STANDARD ACCESSORIES

Two modes selection, Fully hydrostatic drive, Track roller guards, Travel motor guards, Wet disc type parking brake, Swing holding brake, Hydraulic idler cushion (HIC), Vandalism cap, Segmented sprocket, Tool box, Electronic monitoring panel. All steel High mount cab includes tinted glass windows, reclining seat, magazine box, ash tray, rubber mat, rear view mirror, cabin fan, wind shield wiper, portable fire extinguisher and room lamp. Counter weight, Automatic lubrication system, Hydraulically operated Auto Lubrication system, Wind shield washer, Front wind shield guard.

## OPTIONAL ACCESSORIES

Heater, Air conditioner, Falling Object Protective Structure (FOPS), Track shoe (1010 mm).





## BRAKES

Hydraulic lock type brakes. Each travel motor is equipped with a brake valve. When the travel / steering levers are positioned in neutral, the brake is automatically applied. When the brakes are applied, the brake valve softens shocks and also serves to regulate speeds when making descent. Oil, 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 piston motors power the swing system through swing machineries with spur and planetary reduction gears. The wet disc type swing holding brake is automatically applied when the control lever is positioned in neutral. 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 : 6000 mm



## UNDER CARRIAGE

Job-proven undercarriage with long track and wide track gauge. Center frame is mounted on the track frames and secured with bolts. Variable track gauge. Sealed tracks. Lubricated rollers and idlers. Hydraulic track tension adjusters with a cushion cylinder. Assembled track-type tractor shoes with double grousers.

Shoe width : 810 mm  
Grouser height : 23 mm  
No. of shoes (each side) : 49  
No. of track rollers (each side) : 8  
No. of carrier rollers (each side) : 3  
Ground pressure (Backhoe) : 162 kPa (1.65 kg/cm<sup>2</sup>)  
Ground pressure (Loading shovel) : 164 kPa (1.67 kg/cm<sup>2</sup>)



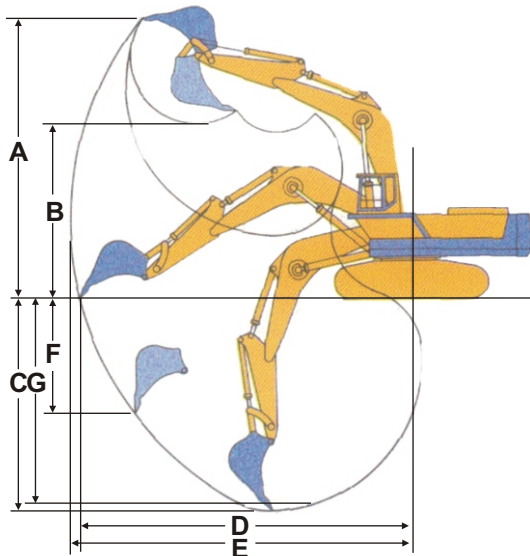
## SERVICE REFILL CAPACITY

Final drive (each side) : 2 x 85.0 ℓ  
Swing drive : 2 x 37.0 ℓ  
Hydraulic oil : 1500 ℓ  
Pump drive (PTO) : 2 x 10.0 ℓ



## WORKING RANGE AND ATTACHMENT (BACKHOE)

Arm		4.1 m	5.0 m
A	Max. digging height	13550	13850
B	Max. Dumping height	8730	9030
C	Max. digging depth	10000	10730
D	Max. Digging reach at ground level	16040	16900
E	Max. Digging reach	16450	17290
F	Max. Vertical digging depth	5630	6260
G	Max. digging depth of cut at 2.44 m level	9900	10630
	Arm crowd force kN (kgf)	535 (54,500)	467 (47,800)
	Bucket digging force kN (kgf)	571 (58,200)	571 (58,200)



## OPERATING MASS (approx.)

### LOADING SHOVEL :

Operating mass including 5,900 mm boom, 4,400 mm arm, 10.2 m<sup>3</sup> SAE/ISO heaped bucket, operator, lubricant and the standard accessories: 175000 kg.

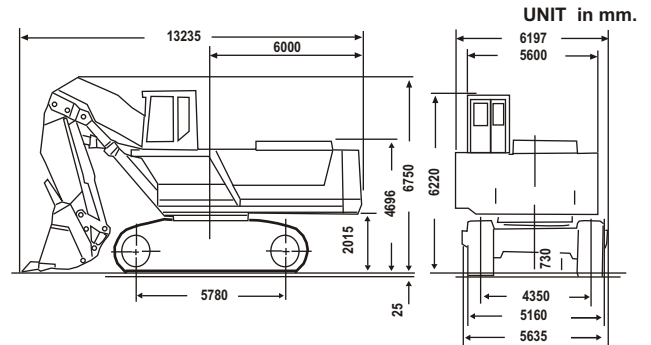
### BACKHOE :

Operating mass including 9,100 mm boom, 4,100 mm arm, 10.5 m<sup>3</sup> SAE/ISO heaped bucket, operator, lubricant and the standard accessories: 170,000 kg.

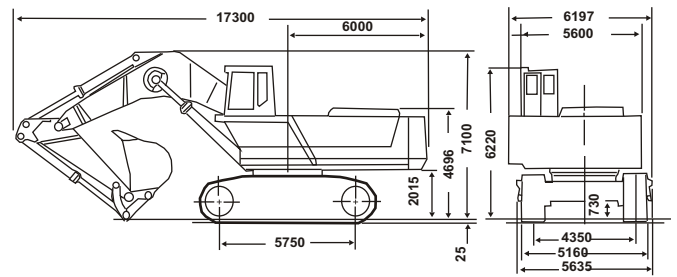


## DIMENSIONS

With 5900 mm boom, 4400 mm arm and 10.2 m<sup>3</sup> bucket

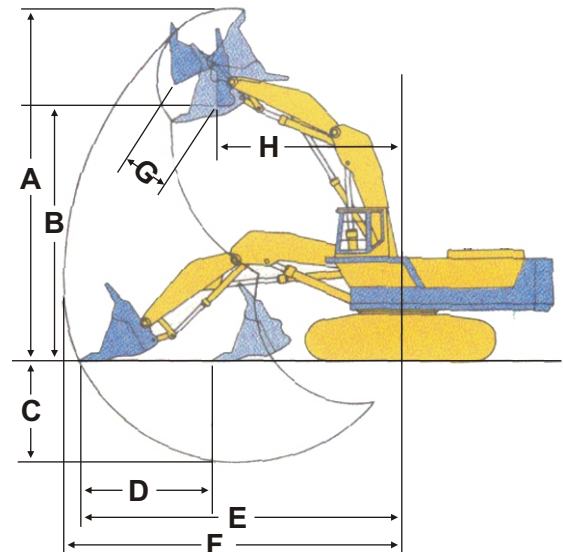


With 9,100 mm boom, 4,100 mm arm and 10.5 m<sup>3</sup> bucket



## WORKING RANGE AND ATTACHMENT (LOADING SHOVEL)

Units in mm	Bottom dump bucket 10.2 m <sup>3</sup>	
A	Max. cutting height	14,110
B	Max. dumping height	10,230
C	Max. digging depth	4,050
D	Level crowding distance	5,220
E	Max. digging reach at ground level	12,500
F	Max. digging reach	13,140
G	Max. Bucket throat opening	1,890
H	Reach at max. dumping height	7,140
	Digging force (bucket)	716 kN (73,000 kgf)
	Digging force (arm)	716 kN (73,000 kgf)



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

# बी ई एम एल लिमिटेड

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A Govt. of India Miniratna Company Under Ministry of Defence

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# बी ई एम एल लिमिटेड

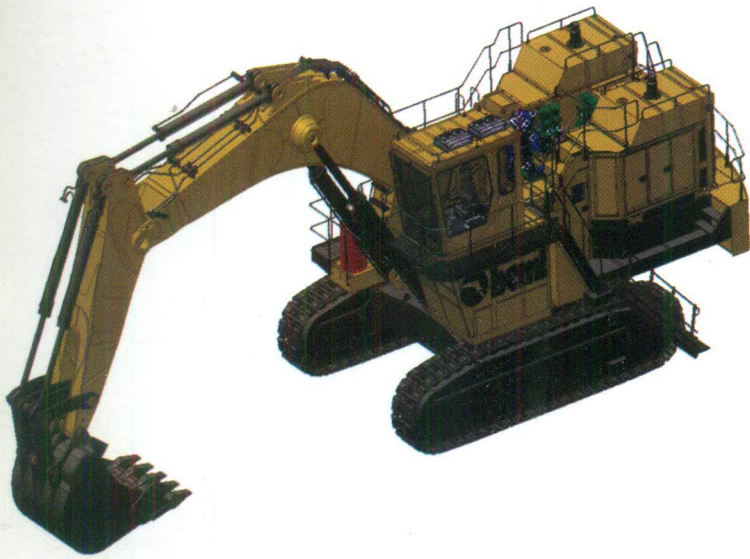
## BEML LIMITED

A Govt. of India Miniratna Company Under Ministry of Defence



# BE1800D

**HYDRAULIC EXCAVATOR**



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

## BACKHOE :

Gross Horsepower : 2 x 354 kW (2 x 475 HP)@2000 rpm

Operating mass : 175000 kg

Bucket capacity : 8.5m<sup>3</sup> - 11.2 m<sup>3</sup>

## LOADING SHOVEL :

Flywheel Horsepower : 2x354kw (2x475 HP) @ 2000 rpm

Operating mass : 175000 kg

Bucket capacity : 7.5 m<sup>3</sup> - 10.2 m<sup>3</sup>



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# BE1800D 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 :

Two BEML diesel engines deliver 2 x 354 kW (2 x 475 hp). 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 assure stable operation for maximum working performance.

### Operator comfort :

Specially designed cab provides plenty of work space and excellent visibility.

### Easy maintenance :

Centralised monitoring systems within the operator's cab allows fast daily checks and also keeps the operator constantly informed of any abnormality during operation.

**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 BSA6D140EG**, 4 cycle, water cooled, overhead-valve, direct injection, turbocharged, diesel engine with water cooler. Six cylinders of 140 mm bore x 165 mm stroke and 15.24 l piston displacement. Electronic governor.

**Gross horse power :** 2 x 354 kW (2 x 475 hp) @ 2000 rpm 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. Positive control Load Sensing System with electronic load limiting control for main pumps for efficient use of engine power. This system also reduces hydraulic loss during operation, resulting in low fuel consumption. Oil-to-air hydraulic oil cooler maintains optimum heat balance of the hydraulic oil.

### Hydraulic pumps

Four variable-capacity piston pumps power the boom, arm, bucket and travel circuits.

Capacity (discharge flow) at engine rated rpm : 4 x 410 l/min

Two variable capacity piston pumps power the swing circuit.

Capacity (discharge flow) at engine rated rpm : 2 x 358 l/min

Tandem gear pump powers the pilot control circuit and AC compressor.

Capacity at engine rated rpm : 2 x (50+25) l/min

### Hydraulic Motors :

**Travel :** Four, Variable displacement axial piston motors with brake/external valve (two for each track).

**Swing :** Two fixed displacement piston motors with external swing holding brake.

### Control Valves :

6/3 way eight spool type x 2

### Relief valve settings

Implement circuits : 31.4 MPa (320 kg/cm<sup>2</sup>)

Travel circuits : 31.4 MPa (320 kg/cm<sup>2</sup>)

Swing circuits : 30.0 MPa (300 kg/cm<sup>2</sup>)

Pilot circuits : 3.43 MPa (35 kg/cm<sup>2</sup>)

### Hydraulic cylinders (Backhoe) :

Cylinder	Number	Bore x Stroke
Boom	2	280 mm x 2660 mm
Arm	2	250 mm x 2180 mm
Bucket	2	200 mm x 2170 mm

### Hydraulic cylinders (Loading shovel) :

Cylinder	Number	Bore x Stroke
Boom	2	280 mm x 2110 mm
Arm	2	225 mm x 1830 mm
Bucket	2	225 mm x 1870 mm
Bottom dump	2	180 mm x 460 mm



## STEERING

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

## STANDARD ACCESSORIES

2 x 24 V / 7.5 kW starting motor, 24 V / 45 A alternator, 2 x 12 V / 200 Ah batteries, air cleaner, dust indicator, two modes selection, Fully hydrostatic drive, Track roller guards, Travel motor guards, Wet disc type parking brake, Swing holding brake, Hydraulic idler cushion (HIC), Vandalism cap, Segmented sprocket, Tool box, Electronic monitoring panel. All steel High mount cab includes tinted glass windows, reclining seat, magazine box, ash tray, rubber mat, rear view mirror, cabin fan, wind shield wiper, portable fire extinguisher and room lamp. Counter weight, Air horn, Automatic Lubrication system, Air assisted greasing system. Air conditioner, FOPS with front wind shield guard cabin with wind shield washer.

## OPTIONAL ACCESSORIES

Heater, Track shoe (1010 mm).





## DRIVES

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

Max. drawbar pull : 1030 kN (105000 kg)

Max. travel speed : 0.75 m/s (2.7 km/h)

## BRAKES

Hydraulic lock type brakes. Each travel motor is equipped with a brake valve. When the travel / steering levers are positioned in neutral, the brake is automatically applied. When the brakes are applied, the brake valve softens shocks and also serves to regulate speeds when making descent. Wet, multiple disc type parking brakes. Which are hydraulically interconnected with travel/steering lever are also automatically actuated on the final-drive shaft.

## SWING SYSTEM

Two piston motors power the swing system through swing machineries with spur and planetary reduction gears. The wet disc type swing holding brake is automatically applied when the control lever is positioned in neutral. 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 : 5980 mm

## UNDER CARRIAGE

Job-proven undercarriage with long track and wide track gauge. Center frame is mounted on the track frames and secured with bolts. Variable track gauge. Sealed tracks. Lubricated rollers and idlers. Hydraulic track tension adjusters with a cushion cylinder. Assembled track-type tractor shoes with double grousers.

Shoe width	: 810 mm
Grouser height	: 23 mm
No. of shoes (each side)	: 49
No. of track rollers (each side)	: 8
No. of carrier rollers (each side)	: 3
Ground pressure (Backhoe)	: 162 kPa (1.65 kg/cm <sup>2</sup> )
Ground pressure (Loading shovel)	: 162 kPa (1.65 kg/cm <sup>2</sup> )

## OPERATING MASS (approx.)

### Loading Shovel :

Operating mass including 5900 mm boom, 4400 mm arm, 9.5 m<sup>3</sup> standard bucket, operator, lubricant, coolant, full fuel tank and the standard accessories. .... 175,000 kg.

### Backhoe :

Operating mass including 9100 mm boom, 4100 mm arm 10.5 m<sup>3</sup> heavy duty bucket, operator, lubricant, coolant, full fuel tank and the standard accessories. .... 175,000 kg.

## SERVICE REFILL CAPACITY

Fuel tank	: 2200 ℓ
Coolant	: 2 x 147 ℓ
Engine	: 2 x 33.5 ℓ
Final Drive (each side)	: 2 x 85 ℓ
Swing drive (each side)	: 2 x 37 ℓ
Hydraulic Tank	: 1500 ℓ
Pump Drive	: 2 x 10 ℓ

## BUCKET RANGE

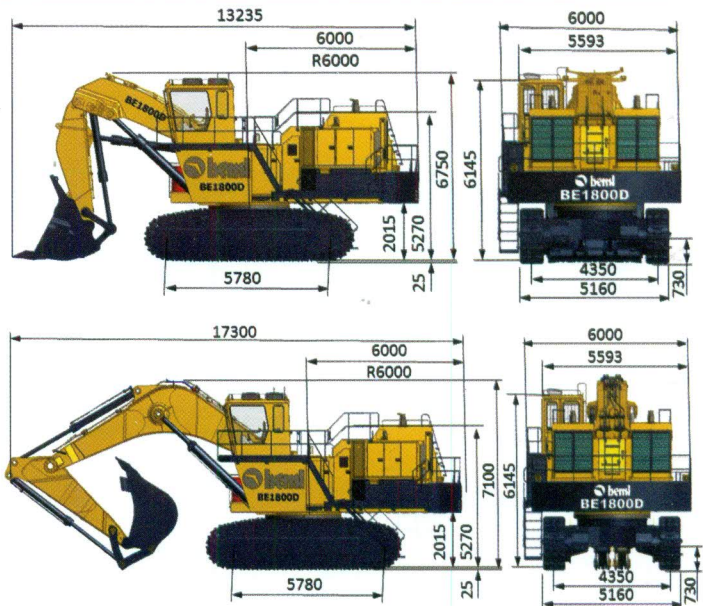
EXCAVATOR	LOADING				BACKHOE	
<b>Bucket Capacity m<sup>3</sup></b>						
Heaped	10.2	9.5	9.5	7.5	8.5	10.5
Stuck	8.1	7.5	7.5	6.1	6.7	8.2
<b>Bucket width in mm</b>						
Without side cutters	3,200	3,000	3,000	2,800	1,995	2,280
With side cutters					2,155	2,440
<b>Bucket Mass (kg) with teeth</b>						
Without side cutters	13,600	13,300	13,900	13,000	6,740	7,950
With side cutters					7,010	8,220
No. of bucket teeth	6	6	6	5	5	5
Bucket type	General Purpose	General purpose	Heavy duty	Rock	General purpose	Heavy duty

## FILTER SYSTEMS

Engine Two stage fuel filter with water separator.  
 Air intake Dry type, two stage air cleaner with dust evacuator  
 Hydraulic Two suction filter, four line filters and six return line filters.

## DIMENSIONS

	Backhoe	Loading shovel
Overall length	17.300	13.235
Overall width	6.000	6.020
Overall height	7.100	6.750
Track length on ground	5.780	5.780
Track gauge	4.350	4.350
Min. ground clearance	0.730	0.730



## WORKING RANGE

EXCAVATOR	SHOVEL	BACKHOE	
<b>BOOM</b>	5900	9100	
<b>ARM</b>	4400	4100	5000
<b>BUCKET</b>	9.5 m <sup>3</sup>		
A. Max. cutting digging width (m)	14110	13550	13850
B. Max. dumping height (m)	10230	8730	9030
C. Max. digging depth (m)	4050	10000	10730
D. Level crowding distance (m) / Max. vertical digging depth	5220	5630	6230
E. Max. digging reach at G.L. (m)	12500	16040	16900
F. Max. digging reach (m)	13140	16450	17290
G. Max. Bucket throat opening / Max. digging depth of cut at 2.44 m level	1890	9900	10630
H. Reach at max. dumping height	7140	9900	10630
Forces kN(kgf)			
Digging Force (Bucket)	716 (73,000)	571 (58,200)	571 (58,200)
Digging/Crowding Force (arm)	716 (73,000)	535 (54,500)	467 (47,800)

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



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A Govt. of India Miniratna Company Under Ministry of Defence

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Figure 1

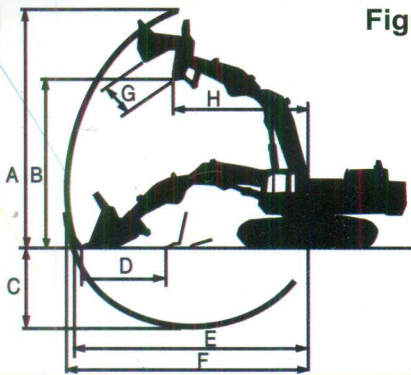
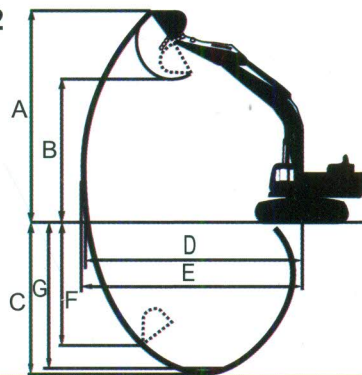


Figure 2



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