

MULTI-TOOL SYSTEMS | MINEWOLF BAGGER

MineWolf Systems AG | Switzerland and Germany

GENERAL DESCRIPTION

The *MineWolf Bagger* has been developed by MineWolf Systems, a Swiss-German provider of mechanical mine clearance machines. The tool consists of a standard excavator (Liebherr R 916) that is equipped with a modular tiller head and power pack.

The complete weight is around 28 tonnes. The tiller and power pack weigh 5,000 kg. All integration efforts, including armouring, will be provided by the manufacturer.

The Bagger can typically clear up to 1,200 m²/h and may effectively be used to clear areas where manual demining proves to be very tedious or impossible: trenches and dams, heavy and dense vegetation, craters and areas where other machines cannot manoeuvre.

The vehicle covers short distances by itself and relies on standard means for longer transport, for example a low-loader.



MINEWOLF BAGGER | With tiller attachment

CLEARANCE METHODOLOGY

The tiller unit cuts vegetation up to 15 cm in diameter and reaches a clearing depth of up to 15 cm in light, medium and heavy soil. The maximum reach radius is ca. 8 m. The tiller head has a working width of 1.4 m, and is equipped with 40 replaceable teeth.

MACHINES IN USE TO DATE

One unit is being operated in Bosnia and Herzegovina and a further unit is working in Southern Sudan with Norwegian s People Aid (NPA).

ENGINE, FUEL AND OIL

The power pack consists of a 240 hp (176 kw) Deutz turbo-diesel engine, typically integrated into the prime mover and sharing the main fuel tank. Fuel consumption under average conditions is 15-20 litres per hour. The hydraulic system uses standard oil.

FACTORY SUPPORT

The manufacturer provides all necessary training, documentation, workshop, consumables and spare parts to render any mine clearing organisation completely independent. Project management and consulting services are also available from the manufacturer. Factory support includes:

- > delivery of machines, support vehicles and hardware from the factory to point of delivery
- > decentralised warehousing in country of operation
- > all major spare parts in stock and ready for shipment
- > predefined fast delivery schedules with renowned forwarding partners worldwide
- > warehousing and efficient resource planning software for customers
- > training schedules as well as spare part packages are provided based on the customer's resources
- > instruction manuals, documentation and SOP (according to IMAS) are available, on request in any language; a spare parts kit is included in the purchase package

The spare part package anticipates long delivery times in remote areas. If necessary a fully equipped mobile workshop unit is also supplied. Only standard commercial off-the-shelf components are used and most suppliers have worldwide service networks.

MAINTENANCE AND SUPPORT

Daily, weekly and monthly maintenance checks are laid down in the operator's manual. The manufacturer offers:

- > in-country support for major incidents
- > assistance on annual inspection with option for check-up of mechanical competence

TESTS AND EVALUATIONS

Demonstrated first at the Humanitarian Demining Symposium 2007, Sibenik, Croatia.

REPORTED LIMITATIONS AND STRENGTHS

Limitations

- > Over longer distances the system will require transportation on a low-bed trailer.

Strengths

- > Effective for ground treatment and clearance in areas where manual demining proves to be very tedious or impossible.
- > Rugged design based on mature technology, proven in challenging terrain.
- > Tiller working tool minimises dust generation for improved visibility.
- > Complements the MineWolf and Mini MineWolf to provide a comprehensive mechanical demining portfolio for all terrains.

DIMENSIONAL DATA

1. Length without attachment	Depends on excavator used
2. Length total	Depends on excavator used
3. Width without attachment	Depends on excavator used
4. Width total	Depends on excavator used
5. Clearing Working width	1,400 mm
6. Height Overall	Depends on excavator used
7. Mass Basic vehicle	23,500 kg - 25,600 kg (without armour)
8. Mass Detachable unit(s)	2,500 kg
9. Mass Overall	Typically 25,000 - 27,000 kg depending on excavator used, eg CAT 320, Liebherr 924, O&K RH9.ETC. (incl. armour, powerpack, tiller)

OPERATIONAL DATA

10. Wheels Tracks (description)	Tracks (50 segments, 600 mm)
11. Ground Bearing Pressure (kPa)	Depending on excavator used
12. Hill climbing ability (in degrees)	Depending on excavator used
13. Number of Cutting Tools	40
14. Beat Pattern (hits per m ²) at different operating speeds	N/A
15. Length of Chains Tools	N/A
16. Diameter of drum	800 mm
17. Rotation Speed	800 rpm (max)
18. Clearance Working depth in varying terrain	15 cm in all terrain
19. Working Speed (m ² /h)	
> Light Soil Medium Vegetation	1,200 m ² /h
> Medium Soil Medium Vegetation	600 m ² /h
> Heavy Soil Dense Vegetation	300 m ² /h
20. Control of Clearance Working depth	Manual
21. Additional attachable working tools	Budget other standard attachment available
22. Armour	Not given
23. Remote controlled	No
> greatest distance	
24. Transportation	
> short distances	Standard means of transport
> long distances	
> sea transport	
> air transport	

SYSTEM STATUS AND DEPLOYMENT

25. Machines in use	2
26. Other types	MineWolf, Mini MineWolf
27. Location of use	BiH, Sudan
28. Totally cleared so far (m ²)	Not given

ENGINE | FUEL | OIL

29. Engine	Diesel engine 157 hp (base vehicle), diesel engine 240 hp (power pack)
30. Engine power at the flywheel	Not given
31. Power at the working tool	Not given
32. Fuel capacity	Depending on excavator used
33. Fuel consumption	15 - 20 l/h
34. Separate engine for working unit	Yes (Deutz turbo diesel engine)
35. Cooling system	Water cooled
36. Oil capacity (both engine)	Not given
37. Hydraulic oil capacity (both engine)	Not given

COSTS

38. Cost of system	Quotation upon request
39. Other costs	Quotation upon request
> training	
> spare part set chains belts	
> repair costs for one year	
40. Availability for hire	Upon request

OTHER

41. Operator comfort	Depending on excavator used
42. Air conditioning	Depending on excavator used

MULTI-TOOL SYSTEMS | PEARSON MINEFIELD TRACTOR

Pearson Engineering Ltd. | United Kingdom

GENERAL DESCRIPTION

The *Pearson Minefield Tractor* is a medium-sized, armoured, mine-protected tractor designed to operate with a wide range of tools (described below). The Minefield Tractor is based on a 110 kw (150 hp) John Deere 6920 tractor with continuously variable transmission (CVT) providing a stepless speed range from 0.05 to 40 km/h. It is fitted with an armoured cab, fuel tank and body panels. It also has “blast-off wheels” on the rear axle, which detach in the event of a mine strike, protecting the driver from life-threatening accelerations. Pearson say the Tractor has been successfully tested against a 10 kg TNT equivalent mine detonation.

The two-door cab is reversible, allowing bidirectional operation. The Tractor has a 8,500 kg lift capacity rear category II/III three-point hitch, three-speed mechanical power take off and up to four double-acting hydraulic power take offs. A 3,500 kg front three-point linkage and 2,000 kg front loader are available. A wide range of commercial attachments, such as buckets and forks, are available for the loader. The Tractor is supplied with pneumatic tyres and with solid tyres capable of withstanding multiple AP mine blasts.



THE PEARSON MINEFIELD TRACTOR | Mine comb in heavy vegetation | Area reduction roller

WORKING METHODOLOGY

The Minefield Tractor is the prime mover and can carry tools on the front or rear for a wide variety of tasks. Most tools can be attached and removed in less than five minutes. Depending on the task, the CVT transmission can operate manually at constant engine speed (for power-take-off work) or work automatically in draft mode to provide maximum fuel economy.

ATTACHMENTS

The following tools are available. All carry a one-year warranty from date of delivery and are supplied with operation, maintenance and parts books in English, with other languages available to order. Spare parts are available from Pearson Engineering.

Mine Comb

The *Mine Comb* is a vehicle-mounted AV mine clearing tool designed for unearthing AV mines in a wide range of ground conditions, including sand, clay and non-metallic roads and dense vegetation. The Mine Comb has a low power requirement and handles the mines gently. Clearing depth is up to 40 cm and width is 3.3 m, and clearing speed ranges from 0.1 to 0.5 km/h, depending on ground conditions. In trials in sand, heavy clay and non-metallic quarry roads, the power requirement never exceeded 80 kw. The Mine Comb is designed to be mounted on the Minefield Tractor or any other suitable prime mover of at least 100 kw and with sufficient hydraulic lift and a mechanical power take off.