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## The Heartlands Group

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## Focus on Machine Assisted Demining

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The development of mechanical mine clearance systems has been a long and protracted affair. It is generally accepted that no single machine can solve all mine problems, and if such a machine were to be developed, its size would probably prohibit it from being of practical use in the field.

The use of mechanical mine clearance equipment must be viewed as a package of components tailored to the requirements of the client and the project. Clearance by mechanical means has met until recently with continued opposition. Some parties, who remained unconvinced that clearance via mechanical means is effective, will argue that this type of clearance does not provide adequate safeguards as to the completeness of the clearance. It could also be argued that clearance by manual methods is wholly reliant on the management of local communities, and as such is subject to the failings and inadequacies of poor management and funding.

Mechanical clearance is aimed at a particular part of the de-mining problem. What is not being suggested is that the equipment involved is appropriate under all conditions. The main objective in utilizing mechanical clearance systems is to safely release land to United Nations standards, in a fast and efficient manner. Machinery has the added advantage of being transferable, and becomes more cost effective than the traditional manually based methods. The well managed use of mechanical clearance equipment can provide for the clearance of as much as 1 hectare per day, with ground being clear to depths of around 50cm and more (Dependent on soil and terrain conditions).



Well managed mechanical clearance will provide an efficient cost effective option, offering a greater level of security to those who ultimately use the land.

All of the clearance equipment marketed by the

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Heartlands Group has been developed to be used in conjunction with readily available prime movers. This provides for a worldwide spares and support system, enabling full continuity in back-up support. The use of these commercially available prime movers has added advantages. Outside of the demining process these units can be utilized in the final preparation of the land prior to the handing over.

The Heartlands Group offers a range of products and services in the field of UXO and Mine clearance. We would be pleased to discuss your requirements, offering an extensive project assessment service, training for machinery operators and project management support where required.

If you have a requirement for equipment and would like to see machinery in the field, call us to arrange a field visit.

## Mechanical UXO & Landmine Clearance Equipment

### UNI-DISC



The UNI-DISC / UD-1 is a 1.2 metre wide tilling drum mounted onto the arm of an armoured 20 tonne or larger, hydraulic excavator. The tilling drum rotates at 300 rpm, mulching the vegetation and soil, detonating and smashing anti-tank, anti-personal landmines and UXO to a depth of approximately 50 cm. Power for the tilling drum comes from a 600 hp Caterpillar engine mounted within the armoured excavator.

The UD-1 is ideally suited for clearance of large agricultural, heavily vegetated and lightly wooded areas, as well as hard to reach places such as roadsides, along rail tracks, around bridges, villages, houses, hillsides, factories, power and telephone services, and other such areas. Blast testing has been carried out with this unit by the British MOD with 10 kg bar mines. The damage sustained to the UD-1 was repaired within half an hour, with the total cost of repair being less than \$75 USD.

**Technical Specifications** – Tilling Width 1.2 metre, reach up to 10 metre, 360° Operation.

**Prime Mover** – Armoured Caterpillar 325, 25 tonne or similar

**Operational Details** – Up to 1 hectare per day, 97 litres of fuel per hour. Figures are

approximate guides and are dependent on the ground and terrain conditions. The UD-1 can be quickly disconnected from the excavator unit allowing the excavator to be used for other operations to assist in area reconstruction.

The UNI-SIFT / US-1 is a unique and versatile ground clearance machine designed to sift sandy, stony, heavy, and light ground that had been prepared by the UD-1 or other ground preparation machines and in soil conditions light enough to be sifted. The 3 X 4 metre vibrating conveyor screen/web is located behind a reclined blade which penetrates the ground to a depth of up to 100 cm.



The US-1 is pushed through the ground by a Prime Mover, sifting at a rate of up to one hectare per day. The speed of clearance and depth of penetration of the leading blade can be varied depending on the terrain. The earth is carried over the screen, web, and objects including mines and UXO greater than the screen grid size are removed to one side. Blast testing has been carried out by the British MOD with up to 9 kg of explosive; damage at 9 kg took 2 hours to repair at a cost of \$1700 USD.



**Technical Specifications** – Sifting Width 3 metre.

**Prime Mover** – Armoured Caterpillar D6H bulldozer or similar.

**Operational Details** – Up to 1 hectare per day, 35 litres of fuel per hour. Figures are approximate guides and are dependent on the ground and terrain conditions.

The US-1 can quickly be disconnected from the bulldozer, allowing the bulldozer to be used for other work to assist in area reconstruction.

**BMHA – 3**

The BMHA-3 Bulldozer Mounted Hydraulic Arm, was developed by the Heartlands Group for the United States Army as an adaptation to their armoured Caterpillar D7G bulldozers. The BMHA-3 has a 12 metre hydraulic extendable arm that has a number of interchangeable attachments. Mountable attachments include out SLASHBUSTER vegetarian removal unit, a range of buckets, claws, rock breakers and out new mini mulcher.



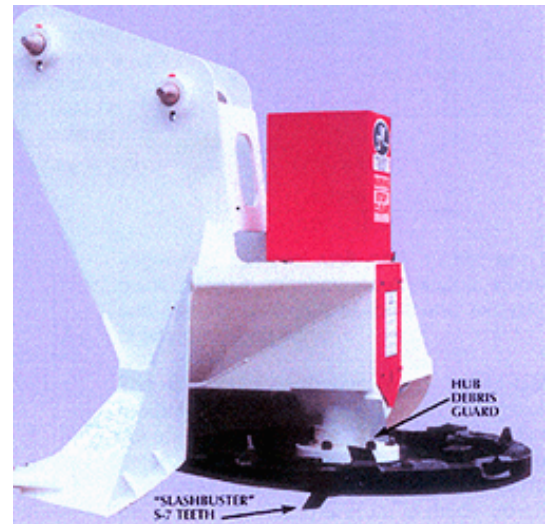


The BMHA-3 is operated by joystick controls from inside the armoured cab. Cameras mounted to both the hydraulic arm and the roof of the bulldozer provide 360° pan and 45° tilt vision along with a zoom lens all controlled from the joy sticks. The slim line television monitor is mounted in the cab directly in front of the operator providing full vision of the working area. Power for the hydraulic arm and its

attachments comes from a Caterpillar powered hydraulic pack mounted to the rear of the bulldozer. The whole BMHA-3 package of equipment can be dismantled from the bulldozer prime mover unit in approximately 3 hours. This allows for the bulldozer to be used for other clearance functions.

### Kingmulch-XL480

The Kingmulch-XL480 is an attachment designed for the clearance of light to medium vegetation. The 48" (122 cm) swath will cut and mulch to approximately 10" in diameter. It is recommended for use with standard to long excavators, being adaptable for 8 to 40 tonne machines. The Kingmulch-XL480 can also be used in conjunction with the BMHA-3 Bulldozer Mounted Hydraulic Arm, as described above. The unit comes with standard automatic wire shear, standard rotating hub debris guard, and standard blade bar cutter.



### Kingsmulch-HD482

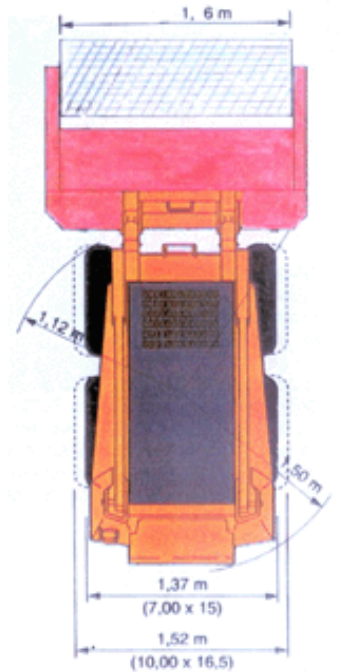
The Kingsmulch-HD482 is an attachment designed for the clearance of medium to heavy vegetation. The 52" (132 cm) swath will cut and mulch to approximately 18" in diameter. It is recommended for use with long front or standard front excavators, being adaptable for 16 to 40 tonne plus machines. The Kingmulch-HD482 unit comes with standard automatic wire shear, standard hub debris guard, standard S-7 cast and hardened teeth on wheel in shroud for mulching blade bar cutter.

**Technical Specifications** – Up to 1315 kg total weight depending on excavator size and options. Wheel speed 350 rpm to 450 rpm.

**Installation Requirements** – A detailed description of hydraulic and electrical requirements are available upon request.

### UNI-MULCH

The UNI-MULCH ground tilling, vegetation and anti-personnel landmine clearing machine has been designed as a small remote controlled unit for use in areas of with difficult access and operational requirements. The PRIME MOVER (tool carrier) is a small remote and manually controlled 4 wheeled skid-steer unit. Power to drive the prime mover and hydraulic system comes from a rugged, fuel-efficient 135-horse power Cummins diesel engine. The prime mover is directly driven through two variable displacement transmission pumps, supplying power and independent control with a hydraulic gear pump responding quickly and providing ample hydraulic flow and pressure to drive the prime mover and attachments. Remote control is operated by a duel control hand held control panel, range of operation is approximately 300 meters in sight, however further control distances can be achieved through a system and cameras. When manual operation is used the control panel sits in a cradle in front of the operator as he sits in the prime mover. Drive wheels are a combination of foam filled and solid rubber cushion tyres; several removable track systems can also be supplied if required. Tools such as the mulcher, vegetation removal unit and bucket are all quick release attachments providing efficient and speedy changing of tools and exchange of any damaged parts.



The UNI-MULCH tool is a 1.5 meter tilling drum that is designed to mulch the ground cover to a depth of approximately 25cm, detonating and destroying any anti-personal landmines and other foreign objects that may be in the ground. The drum is made up of a number of cutting teeth strategically placed around the drum. The cutting teeth are easily replaced and variations of teeth pattern can be used, depending on ground conditions.



Driving the UNI-MULCH are two hydraulic motors mounted externally onto the drum. All components of the drum are easily replaced through wear and tear or a combination of detonation. The quick coupler enables the operator to change the UNI-MULCH to another tool within ten minutes.

The UNI-CUT (tool), is a vegetation removal unit providing a 1.6 meter cutting platform that has two large rotating straight cutting blades. Mounted on the quick release system to the front of the prime mover, the UNI-CUT is designed to cut vegetation as part of an area reduction program. UNI-CUT is designed to remove light to medium vegetation and will take small anti-personal landmine blasts with minimum damage. Once the mined area has been identified the UNI-CUT is de mounted from the prime mover and replaced with the UNI-MULCH. The UNI-MULCH would then be

used to till the ground detonating the anti-personal mines that remained.

**OPTIONAL ATTACHMENTS (tools).** The Prime Movers utilization can be enhanced by an assortment of tool attachments such as buckets, dozer blade, forest blade, forest rake, pallet forks, side-shift backhoe, flail vegetation remover, hydraulic hammer.

### SPECIALIST MACHINES FOR A SPECIALIST MARKET

#### PRIME MOVERS

The Heartlands Group provide an extensive package of armoured prime movers. Each piece of equipment is generally tailored to client's individual requirements. The Heartlands Group would be pleased to discuss your requirements and provide assistance whenever possible.

