

Journal of Conventional Weapons Destruction

Volume 7
Issue 3 *The Journal of Mine Action*

Article 25

October 2003

The Truth About Flails

CISR JMU
Center for International Stabilization and Recovery at JMU (CISR)

Follow this and additional works at: <https://commons.lib.jmu.edu/cisr-journal>



Part of the [Defense and Security Studies Commons](#), [Emergency and Disaster Management Commons](#), [Other Public Affairs, Public Policy and Public Administration Commons](#), and the [Peace and Conflict Studies Commons](#)

Recommended Citation

JMU, CISR (2003) "The Truth About Flails," *Journal of Mine Action* : Vol. 7 : Iss. 3 , Article 25.
Available at: <https://commons.lib.jmu.edu/cisr-journal/vol7/iss3/25>

This Article is brought to you for free and open access by the Center for International Stabilization and Recovery at JMU Scholarly Commons. It has been accepted for inclusion in Journal of Conventional Weapons Destruction by an authorized editor of JMU Scholarly Commons. For more information, please contact dc_admin@jmu.edu.



Issue 7.3, December 2003

Information within this issue may be outdated. [Click here](#) to view the most recent issue

The Truth About Flails

Developed in the 1940s for use in World War II Europe, the flail was designed and proliferated to satisfy the demining community's hunger for faster, safer and more efficient clearance methods. Despite being the most widely used mechanical demining tool in the world, the flail has been labeled by many experts as overused and misrepresented. Still, others believe the flail is an indispensable part of their demining program.

by David Hartley, MAIC

Introduction

Although they come in a broad spectrum of types and sizes, flails all conform to the same essential principles. Hammers on the end of chains are attached to some type of rotating drum or shaft. The spinning axle causes the hammers to beat the ground rapidly, with the intent of detonating mines and UXO. The flail is generally mounted on the front or rear of a heavily armored vehicle, which can resemble anything from a tank to an agricultural tractor—or even a small remote-controlled robot.

Claims of the Manufacturers

The cost of a flail varies, but all are considerably expensive. The Aardvark Flail, probably the most common mine clearance vehicle in the world, costs approximately half a million dollars (U.S.)—a price tag that most non-governmental organizations (NGOs) cannot afford. According to flail manufacturers though, the vehicle's efficiency easily offsets its expense. With an "overall cost of \$0.33 per sq m" and a clearance rate of "about 600 sq m per hour," the flail would appear poised to dominate the world of mechanical mine clearance. Furthermore, according to the same manufacturer, "there have been no cases of mines left unexploded, undetected or not destroyed, except due to operator error or extraordinary situations." Subsequently, all flail manufacturers assert that there has never been a recorded flail-caused injury. Some have claimed that flails work in a variety of environments and soil types, for both mine and vegetation clearance.

Refutations of the Users

Cost

First, it seems very few users have recorded a cost anywhere near \$0.33 per sq m—some estimates have even been as high as \$2 per sq m. Costs incurred by the use of a flail include spare parts, modifications, training, repairs and method of transportation, some of which can inflate operating costs considerably. It is worth noting that flails consume large quantities of fuel, a precious commodity in many parts of the developing world. Also, most heavily mined countries lack a well-developed road system, necessitating the use of alternate methods of transportation. To move a flail over a long distance, often a flat bed or articulated truck is needed; still others have separate tires for transportation. With such high operating costs, it is a wonder that flails are used at all. Many countries that manufacture them, however, have donated the machines to heavily mined areas—a practice that some critics label as a selfish attempt of the nations to boost their own industrial economy and improve their public image.

Safety and Clearance Capability

The aforementioned claim that flail demining does not leave unexploded mines or UXO is vehemently disputed by many members of the mine action community. One expert ventured so far as to say that "any manufacturer who states that his machine will leave the ground ready to hand back to its former users is dreaming." There are many cases of mines being left unexploded or even being thrown far from their original placement. The considerable weight and horsepower of a large flailing device is enough to severely disrupt

the vegetation (a sometimes desirable result), break and throw mines, but not always detonate all explosives. Whether due to striking the contaminant at an awkward angle and subsequently missing the fuse, not penetrating deep enough to reach the explosive, or simply a freak accident, popular consensus suggests that flails do miss a significant number of landmines. It must also be considered, noted one Africa-based mine action official, that several mines have been designed to withstand the flailing method.

Moreover, some experts believe that flails are inappropriate for dealing with UXO. Most UXO simply contains a higher quantity of explosive material than a standard AP mine, perhaps enough to damage or destroy a flail. Also, for a variety of reasons, flails can leave some ordnance undetonated. Worse still, there have been cases of a flail encountering fuse-down UXO and reorienting them so that the fuse or detonation trigger is pointing up—thus rendering the explosive much more dangerous. As is the case with mines, flails tend to break up and fling UXO about. Even if the shattered UXO/mines are non-explosive and safe, the smaller and potentially thrown pieces of metal can sometimes make follow-up work with metal detectors laborious. Also, in certain cases, “if any mines are broken up and damaged, explosives are strewn around and dug-in, making the responsible use of dogs impossible.”



Although flails are common to many demining operations, some people question their quality and cost-effectiveness. c/o J.

Such complications have led some demining professionals to limit their use of flails. “I would never send a flail into an area suspected of containing anything larger than an AP mine,” noted one expert. All agree that flails should be kept far away from AT mines, and most seem to think that they are not the most appropriate tool for the neutralization and removal of UXO.

Finding a Niche for the Flail

As is often the case in such polarized disagreements, the truth lies somewhere in the middle—and the demining community seems to be catching on. Even those who believe the flail to be “contrary to every premise concerning safety and efficiency that humanitarian mine action is based on” will concede that, in some situations, it has considerable utility and value. And while manufacturers continue to make “wild and inaccurate claims” about flails, demining organizations continue to use them.

Although flails have proven to be largely ineffective in areas of rocky soil, to some they are indispensable in heavily foliated sites. Mine-Tech, a commercial demining organization, uses modified flails in virtually all of their many active sites. Willie Lawrence, an internationally respected representative for Mine-Tech, stated that the flails were used exclusively to clear surface vegetation and to reduce the risk of trip-wire contamination. The ground is not breached at all by the spinning hammers. By using the flail only to prepare the ground for demining teams, the risk of throwing or pushing mines to the side is greatly diminished. More importantly, Mine-Tech’s modified flails are capable of “transforming very difficult areas into ‘Category A’ ground at a rate of about 10,000 sq m a day,” according to Lawrence. This vegetation clearance and ground preparation allows manual clearance teams to operate at approximately twice the speed and efficiency. It is not difficult to appreciate the value of the flail to Mine-Tech’s highly sophisticated demining operations.

Other experts generally concur, albeit often begrudgingly, with Mine-Tech. One expert admits that “there is plenty of documentary evidence to argue compellingly that the use of an AP-protected flail/mulcher to cut undergrowth in advance of deminers in areas with bounding fragmentation mines increases safety significantly.” Another international demining consultant noted that he would strongly consider using a flail for vegetation clearance, depending on the presence of UXO. Still another expert who attacks the flail’s versatility concedes that they are “excellent tools for preparing ground” and area reduction, and “they also enhance the safety of manual deminers by tremendously reducing the tripwire and booby trap threat.”

Conclusion

According to many top mine action authorities, the flail is simply not the universally applicable answer to the world’s landmine and UXO problem. To run a flail over a mined area and declare it safe, without any verification, would be disastrous and foolhardy. Flails do leave some mines unexploded. They do throw mines. They do break mines and UXO

into pieces, making metal detector and dog verification difficult. They cannot neutralize anti-vehicle landmines. In short, flails are not what their manufacturers would like them to be. This does not mean, however, that they are useless or should be discarded and forgotten. If used properly and within its means, the flail can increase the safety, efficiency and cost of certain demining operations. The trick, apparently, is knowing how to use them, where to use them, when to use them and when not to use them. If used appropriately, the flail is a valuable part of the deminers' toolbox.

References

Because of the potentially sensitive subject matter, all those quoted in this article will be left anonymous except where otherwise noted.

Contact Information

David Hartley

E-mail: otbeatboxer@hotmail.com