Ararat Company | Northern Iraq

## GENERAL DESCRIPTION

The *NOMA Flail* is manufactured by the Ararat Company, a regional producer of mechanical demining equipment in Northern Iraq. The mini flail system is designed for ground preparation tasks by cutting vegetation, softening the ground and removing obstacles. The machine is remotely controlled by an operator from a suitable distance. All the parts, even the chassis, are designed to resist explosion pressure. It is an economic, simple machine and easy to maintain.

A prototype machine was manufactured in 2001. Following a successful six-month test, UNOPS Mine Action Programme then requested six more machines with minor modifications from the prototype. In November 2001, Ararat was contracted by UNOPS to manufacture the six machines. Support teams were recruited, trained, accredited and deployed by May 2002.

NOMA FLAIL

## GROUND PREPARATION METHODOLOGY

NOMA flails have 65 chains each tipped with a reinforced steel hammer. Depending on terrain and soil conditions, the flail can penetrate the ground up to depth of 20 cm. The flail is designed to prepare the ground by cutting vegetation, removing obstacles, loosening the soil and breaking and/or detonating the AP mines as well as AV mines like the VS2.2. Depending on ground type, the production rate is approximately 3,000 $m^2$ per day.

## MACHINES IN USE TO DATE

Seven machines were used by Ararat for the UNOPS programme from 2000 to 2003 and since then in Iraq/Suleimanyah.

## ENGINE, FUEL AND OIL

The NOMA Flail has one diesel engine, the 160 hp F6L913 Deutz requiring 12-13 litres per hour under normal conditions.

## FACTORY SUPPORT

A basic spare parts set is included in the purchase package. Heavy maintenance for the machine can be provided on request. Mechanic and operator training as well as refresher training can be provided.

## MAINTENANCE AND SUPPORT

On-site visits by a technical team with mobile workshop can be arranged with the manufacturer.

## TESTS AND EVALUATIONS

No information yet available.

## REPORTED LIMITATIONS AND STRENGTHS

- Creates dust clouds, as with all flail systems in dry environments.
- Difficult to operate with precision from greater distances, as with all remotely controlled machines.

| TECHNICAL SPECIFICATIONS | NOMA FLAIL |
|---|---|

## DIMENSIONAL DATA

| | |
|---|---|
| 1. Length without attachment | 4,000 mm |
| 2. Length total | 5,200 mm |
| 3. Width without attachment | 2,100 mm |
| 4. Width total | 2,800 mm |
| 5. Clearing \| Working width | 2,300 mm |
| 6. Height \| Overall | 2,500 mm |
| 7. Mass \| Basic vehicle | 5,000 kg |
| 8. Mass \| Detachable unit(s) | 2,000 kg |
| 9. Mass \| Overall | 7,000 kg |

## OPERATIONAL DATA

| | |
|---|---|
| 10. Wheels \| Tracks (description) | Wheels |
| 11. Ground Bearing Pressure (kPa) | Not given |
| 12. Hill climbing ability (in degrees) | Not given |
| 13. Number of Chains \| Chisels \| Tools | 65 Chains |
| 14. Beat Pattern (hits per $m^2$) at different operating speeds | Not given |
| 15. Length of Chains \| Tools | 70 cm |
| 16. Diameter of drum | Not given |
| 17. Rotation Speed | 350 - 400 rpm |
| 18. Clearance \| Working depth in varying terrain | |
| 19. Working Speed ($m^2$/h) | |
| > Light Soil \| Medium Vegetation | 500 $m^2$/h |
| > Medium Soil \| Medium Vegetation | |
| > Heavy Soil \| Dense Vegetation | 400 $m^2$/h |
| 20. Control of Clearance \| Working depth | Manual |
| 21. Additional attachable working tools | |
| 22. Armour | 10 mm |
| 23. Remote controlled | Yes |
| > greatest distance | |
| 24. Transportation | |
| > short distances | From site to site by a low bed trailer |
| > long distances | |
| > sea transport | |
| > air transport | |

## SYSTEM STATUS AND DEPLOYMENT

| | |
|---|---|
| 25. Machines in use | 7 |
| 26. Other types | No |
| 27. Location of use | Northern Iraq |
| 28. Totally cleared so far ($m^2$) | 2,000,000 $m^2$ |

## ENGINE | FUEL | OIL

| | |
|---|---|
| 29. Engine | Deutz diesel engine with 160 hp |
| 30. Engine power at the flywheel | Not given |
| 31. Sufficient power supplied to working tool | Not given |
| 32. Fuel capacity | Not given |
| 33. Fuel consumption | 8 - 10 l/h |
| 34. Separate engine for working unit | No |
| 35. Cooling system | Air cooled |
| 36. Oil capacity of engine (both engines) | 13 l |
| 37. Hydraulic oil capacity (both engines) | 120 l |

## COSTS

| | |
|---|---|
| 38. Cost of system | Not given |
| 39. Other costs<br>> training<br>> spare part set chains \| belts<br>> repair costs for one year | Not given |
| 40. Availability for hire | Not given |

## OTHER

| | |
|---|---|
| 41. Operator comfort | N/A |
| 42. Air conditioning | N/A |

DEMCO (Pty) Ltd. | South Africa

## GENERAL DESCRIPTION

*DEMCO* have a range of landmine detonating systems that can be fitted to commercial platforms (prime movers). The prime movers are armour plated with 10 mm, 8 mm and 6 mm Armox, depending on the vulnerability of the components needing protection and also the design structure of the machine chassis, doors, bonnets, etc.

All cabs have double doors or an escape hatch in the roof to ensure that the operator is not trapped in an emergency.

The Komatsu W93R-2 is fitted with 8.5 mm Armox for the cab, doors, bonnet, engine, radiator, fuel and oil tanks, transmission and drive train. The armour glass is 52 mm. The cabin is air-conditioned and the windows provide all-round visibility.

Other wheeled and tracked excavators, loaders and bulldozers can be used as prime movers for DEMCO mine clearance attachments. Various demining tools can be attached to the extending boom to conduct ground penetration and clearance tasks.


The available attachments are:

- single detonating disc system
- double detonating disc system for roads and runways (width 1 m to 4 m)
- filter buckets
- ripper rakes
- rotovators (width 1 m to 4 m)
- flailing system (width 1 m to 4 m) optional with magnetic debris removal array
- bush cropping buckets
- movers and stump removers
- magnetic debris removal system

The machine is effective on rugged terrain. Simplicity of design of the attachments allows for fast interchange to suit terrain conditions.

Standard construction engineering attachments can also be fitted, giving added task flexibility. The attachments are well suited to clearance of difficult ground such as ditches and banks. All attachments are adaptable to small or large machines.