

# Fact Sheet

## HIGH-MOBILITY MULTIPURPOSE WHEELED VEHICLE (HMMWV) SNOWPLOW

### PROBLEM

In the recent past, especially in U.S. Army Europe (USAREUR), the Army had extremely limited access to snow removal equipment. The only available implements were graders, the M-9 armored combat earthmover (ACE), and the front-end loader for the small emplacement excavator (SEE). The SEE was designed with snowplowing capability, but snowplows were not available in the inventory in 1995. Also, the SEE was a scarce item and heavily employed where deployed.

Because of the winter deployment of troops into Bosnia and Macedonia, HQ, V Corps, and HQ, USAREUR, requested a quick response to the problem, especially in Macedonia for Task Force Able Sentry (TFAS). TFAS has a 1966 2-1/2-ton truck rigged with an old 10-foot snowplow that works quite well on base camp roads. TFAS also has a 1978 German-manufactured Unimog with snowplow; this vehicle with plow works well and was transferred to the Brown and Root Service (BRS) Company in 2001. In addition to the truck and Unimog, TFAS has a SEE with a 30-year-old snowplow assigned to BRS and available to the Engineer attachment at TFAS.

In October 1995, a special team was organized by HQ, USAREUR, to go to Macedonia and review requirements for the upcoming winter season. U.S. Army CRREL was tasked to send a team member proficient in snowplows and snowplowing to teach snowplowing operations and conduct hands-on training. The TFAS commander requested a quick resolution to the problem of safe, efficient, and effective snowplowing.

### SOLUTION

CRREL obtained a commercial off-the-shelf (COTS) snowplow specifically engineered for the commercial Hummer. The plow is manufactured by the Fisher Engineering Company and the mount is manufactured by Arrowhead Engineering, Inc. The plow uses a quick-disconnect system called Minute-Mount; once the mounting brackets and a wiring harness have been installed semi-permanently, the plow and all other attachments can be mounted in less than a minute and can be dismantled in half a minute. The mounting brackets require no drilling, cutting, or welding on the HMMWV. Instead, bolt holes in the frame and bumper are used; the wiring harness plugs into the current lighting harness and the power cable runs from a solenoid through the fire wall to the battery. A controller cable is run through the fire wall to the plow control switch, which is mounted on the dash with Velcro.



*HMMWV with snowplow.*

A plow was obtained by CRREL, mounted on a HMMWV, and demonstrated and evaluated on hard-surface and gravel roads, trails, and fields at the Ethan Allen Firing Range in Jericho, Vermont. Snow depths averaged four to nine inches and various depths from one inch to nine inches were plowed. In accordance with previous study data, snowplowing operations should be conducted during a storm, and ideally should commence before snow depth reaches four inches to permit the greatest efficiency and effectiveness.

The 9-foot by 29-inch, 11-gauge steel, trip-edge snowplow was purchased with a continuous curve snow foil and a 1090 high-carbon steel cutting edge. The pump, hydraulics, headlights, directional lights, and attaching A-frame are integral to the plow, as are the trip-edge and trip-edge springs. It has reversible angle control as well as up-and-down control, and the integral trip-edge folds back and allows the plow to ride over obstacles up to four inches high. When the obstacle is cleared, spring tension is released, returning the edge to its normal plowing position. Follow-on tests showed that the use of tire chains provided additional traction (a significant benefit when plowing uphill) and reduced the incidence of tire spin. Chains also provided increased control when plowing downhill. (For more



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information, see ERDC/CRREL Special Report SR-02-1, *Snow and Ice Control (SNIC) Equipment and Its Use by Military Units Worldwide*. \* To request a paper copy, write to CRREL, Attention: Librarian, 72 Lyme Road, Hanover, New Hampshire 03755-1290.

More than 170 HMMWV snowplows are being operated by the U.S. Army in Macedonia, Bosnia, Kosovo, Korea, and Germany, as well as at Fort Drum, New York, and at seven other CONUS locations. To date, some snowplows have accumulated more than 4,000 snowplowing miles during six winter seasons without any significant maintenance or operational problems. For greater safety, the nine-foot blade was replaced with an eight-foot blade.

At the request of the Commanding General, U.S. Army Engineer School, this snowplow is available through the Defense Supply Center in Philadelphia, Pennsylvania. For a complete package, which includes the snowplow, all vehicle components, and all required attachment gear, use NSN 3820-01-473-2777.

\* [http://www.crrel.usace.army.mil/techpub/CRREL\\_Reports/reports/SR02-1.pdf](http://www.crrel.usace.army.mil/techpub/CRREL_Reports/reports/SR02-1.pdf)

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