

Fact Sheet

HIGH-MOBILITY MULTIPURPOSE WHEELED VEHICLE (HMMWV) SNOWPLOW

PROBLEM

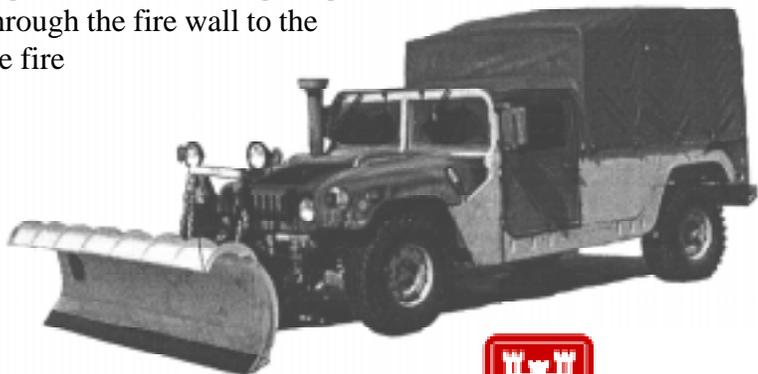
In the recent past, especially in U.S. Army Europe (USAREUR), the Army had extremely limited access to snow removal equipment. The only implements available were graders, the M-9 armored combat earthmover (ACE), and the front-end loader for the small emplacement excavator (SEE). The SEE was designed with snowplowing capability, but snowplows were not available in the inventory. 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 2¹/₂-ton truck jury-rigged with an old 10-foot snowplow that, if made operable, would be a safety hazard. The truck has obsolete nondirectional combat cord (NDCC) tires; a broken windshield; no windshield wipers; missing or broken fuel, temperature, and speed gauges; and brakes that are long overdue for replacement. TFAS also has a Unimog with snowplow, but it is marginally operational and unsafe because it will not operate in four-wheel drive and regularly slips out of gear. The vehicle's repair estimate in 1996 was \$3000+; it still has not been fixed. In addition to the truck and Unimog, TFAS has a SEE with a jury-rigged snowplow; however, by 1996 three rotations of units had spent several hundred hours working on it and still had not made it operable. For the 1997–1998 winter rotation, it remained deadlined, reportedly for parts.

In October 1996, a special team was organized by HQ, USAREUR, to go to Macedonia and review requirements for the upcoming winter season. The TFAS commander requested a quick resolution to the problem of safe, efficient, and effective snowplowing. U.S. Army CRREL was asked to send someone proficient in snowplows and snowplowing, not only to be a team member but to teach snowplowing operations and conduct hands-on training.

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 have been installed semipermanently, 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.

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 U.S. Army/Vermont National Guard Ethan Allen Firing Range training area in Jericho, Vermont. Snow depths averaged four to six inches and vari-



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ous depths from one inch to 8¹/₂ inches were plowed. In accordance with data from previous studies, snowplowing operations should be conducted during the 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 the trip-edge springs. This heavy-duty plow is commonly used on commercial Chevrolet/GMC K2500, Ford F250, and Dodge W2500 series pickup trucks. 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. During snowplowing demonstrations, 450 pounds were loaded into the back of the HMMWV; however, no significant advantage was observed even when plowing uphill. The practice of adding weight is neither encouraged nor discouraged, but any weight in the back must be secured. 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 information, see the HMMWV snowplow operator's guide.)

STATUS

Eight snowplows are being operated by the U.S. Army: four are with TFAS in Macedonia, three are with the 41st Engineer Battalion at Fort Drum, New York, and one is being used by the Vermont Army National Guard in Jericho, Vermont. To date, these snowplows have accumulated more than 1200 snowplowing miles during two winter seasons without any maintenance or operational problems. At the request of the Commanding General, U.S. Army Engineer School, this snowplow is expected to be available through the Defense Construction Supply Center in Columbus, Ohio, by September 1998. In the meantime it can be purchased under provisions of AR 71-13 from Arrowhead Equipment, Inc., of Glens Falls, New York, for \$4357.

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