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IMPROVING THE SAFETY OF THE TRANSPORTATION OF EXPLOSIVES

Yevhen Makarov,

PhD, Lecturer of the Department of Pyrotechnic and Special Training,
National University of Civil Defence of Ukraine, Ukraine

Serhii Hassiev,

Lecturer of the Department of Pyrotechnic and Special Training,
National University of Civil Defence of Ukraine, Ukraine

Polishchuk Dmytro,

Lecturer of the Department of Pyrotechnic and Special Training,
National University of Civil Defence of Ukraine

The territory of Ukraine is mined by 30% according to the Multimedia platform of foreign broadcasting of Ukraine Ukrinform [1]. Therefore, the most difficult task after the end of hostilities is to restore the state of the territory for the safe stay of the people living there. The main task for this is to clear the mined areas. The largest part of the work on clearing the area from explosive devices (hereinafter referred to as explosive objects) in the structure of the Ministry of Internal Affairs is assigned to the pyrotechnical units of the State Emergency Service of Ukraine. One of the important aspects that relates to the work during demining is the transportation of explosive objects to the place of destruction.

Let us consider what specialized vehicles exist for the transportation of explosive objects in the structure of the State Emergency Service of Ukraine.

Pyrotechnical machine of light type (hereinafter referred to as PM-L) on the basis of all-terrain passenger cars – special vehicles that are designed on the basis of all-terrain passenger cars and are designed for the transportation of special property and equipment, ensuring demining works and further transportation of explosive objects of small caliber to the place of destruction [2].



Fig. 1 – PM-L based on the IVECO DAILY 55S

Pyrotechnical machine of heavy type (hereinafter referred to as PM-H) on the basis of all-terrain trucks - special vehicles that are designed on the basis of all-terrain trucks and are designed for the transportation of special property and equipment, ensuring demining works and further transportation of explosive objects of various calibers to the place of destruction [3].



Fig. 2 – PM- H based on the MAN TGM vehicle

Armored pyrotechnic vehicles based on all-terrain truck and passenger car chassis with wheel formula 6×6 or 4×4 are special armored vehicles with bulletproof and anti-mine protection. They are designed on the chassis of all-terrain truck and passenger cars and are designed for the transportation of special property and equipment, ensuring demining work in areas close to combat zones and further transportation of explosive objects of various calibers to the place of destruction.

Structurally, pyrotechnic vehicles for the transportation of explosive objects are reduced to the transportation of explosive objects to the place of work inside the car. The personnel is protected from unauthorized activation by a wall of only 60-70 cm filled with sand or soil. This approach is not optimal for the full protection of personnel who are inside such vehicles.

To improve the safety of transportation of explosive objects by pyrotechnic units, it is necessary to transport explosive objects in specially equipped trailers for the transportation of objects that can explode. A simple design, in the form of a cylinder with an open top, will provide effective directional energy into the air, and explosion-proof walls around will prevent the scattering of fragments and the negative effects of the shock wave. The personnel will be sufficiently distanced from the epicenter, which will reduce the possible consequences of the explosion.

Also, this trailer system has a cheaper price compared to full-fledged cars equipped for the transportation of explosive objects, and therefore, in case of unauthorized operation, it will incur less losses to the state.



Fig. 3 – PKI 9275 Trailer system for transporting of explosive objects

In general, the use of trailer systems for the transportation of explosive objects is widely used in the developed countries of the world. Also, the use of such systems will lead to a reasonable and safe approach to the transportation of explosive objects, and can save human lives.

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