Kidde Graviner

Military Vehicle Fire Protection

Introduction

Kidde Graviner is part of the Kidde Plc group which comprises over 30 companies, including Kidde Deugra GmbH, L'Hotellier and Kidde Dual Spectrum.

Together these four companies provide an unparalleled force in fire and explosion protection capability for military vehicle applications by offering the safest systems available for the protection of armoured fighting vehicles and battle tanks from enemy attack.

Photographs courtesy of Vickers Defence Systems, Krauss Maffei, Marconi Marine (VSEL), Alvis Vehicles Ltd & GKN Defence

Crew Bay Explosion, Detection & Suppression System

A military vehicle is designed for strength, its armour affording protection to the crew and giving them the confidence to perform in battle. But the possibility remains that penetration of its fuel tanks or fuel and hydraulic lines can lead to a devastating fireball, causing severe burning and toxic gas poisoning within milliseconds.

Even the most heavily armoured fighting vehicle is susceptible on the battlefield to penetration by high velocity kinetic energy weapons or missiles carrying high explosive warheads. The constraints of vehicle design mean fuel must often be stored adjacent to the crew compartment and, if penetration is through a fuel tank, so that forcible injection of atomised fuel coincides with the presence of a high energy ignition source, a severe explosive fire results.

Typical crew bay system equipment set

This threat inevitably affects crew morale and it is therefore important to give the crew a means of surviving in the battlefield environment.

The crew bay system is able to sense the incipient hazard and recognise it as an explosive fire within 2-3ms and to effect complete suppression in approx 100ms. It uses fast response sensors and rapid acting high-rate discharge suppressors.

Because suppression has taken place in a few tens of milliseconds, the radiation from the fireball is harmless, the temperature rise is minimal, the pressure increase is survivable and, most importantly, the amount of toxic gas generated is limited to safe levels. The vehicle and crew have survived to fight another day.

Kidde Graviner crew bay systems are fitted to a range of current vehicles including:

* CRARRV
* Warrior 2000
* Marconi Marksman
* Khalid
* Tavern
* Leopard 2
* Tariq
* T90

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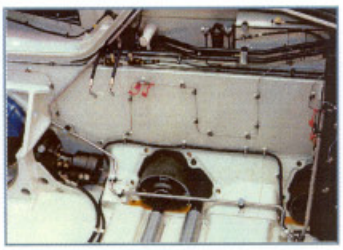
Engine Compartment Fire Detection & Extinguishing System



Typical FIREWIRE installation

The engine compartment fire protection system has been designed to detect and extinguish engine fires caused by fuel leaks or overheating of the engine. Several seconds are typically available to suppress the fire and, generally, temperature detection is sufficiently rapid.

A typical engine compartment system may consist of a control unit, continuous linear temperature sensors mounted on the inside of the compartment and an extinguishant distribution system, complete with extinguishers, mounted externally to the compartment.

Engine bay control unit

The temperature sensor is proven to not only be a reliable detector of fires but also of engine overheating. The element survives intense heat and, since it is monitored from both ends of a loop, detection performance is maintained even if it is severed, crushed or flattened. The control unit provides a warning signal if a fire is detected within the engine compartment. Extinguishing is achieved utilising an electrically actuated high rate discharge system.

Engine bay systems are fitted to a range of current vehicles including:

Engine bay extinguisher

* AS90
* Tavern
* Piranha
* CRARRV
* Warrior 2000
* Scorpion
* T90
* Khalid
* MRAV
* Challenger 2
* Shielder
* Stormer
* Leopard 2
* K1
* ACAVP

Other Applications

The major sector of the vehicle fire protection market is represented by the systems which protect the crew and engine bays of battle tanks or armoured personnel carriers as described above. There are, however, many other commercial applications where Kidde systems are used. These include automobiles carrying VIPs or the security forces, transit buses, school buses and high value off-road vehicles.

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