



# **White Paper:** **Wire Rope Lanyard Usage in the Armed Forces**

Why and How to Select a Quality Cable Manufacturer



# ◆ Abstract

The purpose of this paper is to highlight the importance of wire rope lanyards used by the United States armed forces and subsequently, the necessity and criteria needed to find a suitable manufacturer and supplier of wire rope lanyards. Examples are provided that demonstrate previous, current, or emerging use cases for wire rope lanyards and which highlight their importance in providing safety, security, and simplicity for American soldiers.

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## ◆ Introduction

Today's Joint Forces face myriad complex issues: global security challenges, fiscal austerity, a shrinking force structure, and consistent pressure to develop superior technologies, all while maintaining a constant state of readiness. Wire rope lanyards help ease a portion of the burden carried by American troops by providing them with assurances of safety when using any number of the military's pieces of equipment to face the threats and challenges. Simultaneously, military lanyards offer a level of convenience when used, commonly enabling better overall results and performance for the application as a whole.

The term wire rope lanyard covers a broad range of products as wire rope lanyards can be extensively customized to meet the needs of a multitude of applications. Many features of wire rope lanyards can be customized, including cable material, cable coating, and fittings within MIL-SPECs standards or materials required by the United States military. A diversified look at the standards and use of wire rope lanyards in the armed forces follows.



## ◆ Air Force

Throughout the military, but particularly in the Air Force, one of the biggest concerns regarding cable connectors is its weight and durability.<sup>1</sup> The need for a break-away connector built-in to the cables used in aerospace and defense applications is commonly considered paramount. If, for example, a cable gets snagged on a soldier's uniform or armament, it needs to be able to disconnect without resulting in damage to either the cable itself or, more importantly, without injuring the soldier.

One example of a break-away connector is the redundant-lanyard-release connector designed by engineers at Eaton Aerospace Group to meet the needs of both the United States Air Force and NASA. The use of quick-release wire rope lanyards enables a loop on one end to be secured to a quick-release pin handle that can be quickly and safely disconnected and, if necessary, reconnected, to provide continuity of service while ensuring the safety of all around.

An additional consideration is the military's need for many break-away cables to function the same if submerged under up to 20 meters of water as they do on land.<sup>2</sup> Military personnel deployed near open water face the possibility of a cable becoming temporarily submerged. This fact, while it may appear obvious or innocuous, nevertheless needs to be accounted for in the design and build of any cable and break-away connector. In these instances, wire rope lanyards can be anodized to increase the thickness of the natural oxide layer on the surface and reduce corrosion. In such an instance, wire rope lanyards could also undergo a chromic acid treatment to meet the MIL-A-8625 standard to further increase their resistance to corrosion.



## ◆ Army Paratroopers

Over the decades, both military and civilian parachuting has improved and evolved; taking advantage of new, lighter materials and advancements in aerodynamics to make the activity increasingly safer. However, the very nature of the activity means that the inherent risks involved will likely never be fully negated. This reality is particularly well-known to paratroopers in the United States Army who continue to face potentially deadly hazards when performing static-line parachute jumps.

To minimize the risks involved in static-line jumps, the U.S. Army has begun testing a new emergency parachute system called the Towed Jumper Recovery System (TJRS). The TJRS can be used when a critical malfunction occurs with a paratrooper's parachute that results in the soldier being dragged behind the aircraft. The TJRS uses a wire rope lanyard and routes it through all of the static-line snap hooks that are attached to the aircraft's anchor-line cable. By threading the lanyard, personnel on-board the aircraft are able to save time by not having to determine which snap hook is connected to the towed jumper. Instead, the loop at the end of the wire rope lanyard gets hooked to the emergency TJRS parachute.<sup>3</sup> Once the lanyard is secured, the anchor-line cable aboard the aircraft is cut, the snap hooks drop, and the emergency parachute is automatically deployed—rescuing the imperiled soldier.

While a towed jumper malfunction is not a common occurrence, it nevertheless accounts for a handful of paratrooper deaths each year and it is a number which has begun to rise in recent years. For U.S. Army paratroopers, wire rope lanyards in the TJRS system are able to provide not just an increased peace of mind, but also tangible safety.<sup>4</sup> With such an integral role in the emergency rescue operations for imperiled members of the United States Army Airborne, the importance of sourcing high-quality wire rope lanyards is essential.



## ◆ Navy Supercarrier

Among the most imposing assets wielded by the United States armed forces, a fully-armed U.S. Navy supercarrier replete with jet fighters and a complement of support aircraft stands as an unrivaled projection of military power. For decades, naval carriers utilized a bridle system that functioned as a catapult to aid in the launching of fixed-wing aircraft. The bridle was a heavy-duty wire rope lanyard that attached to rearward facing hooks on either side of the aircraft. The wire rope lanyard would then be run down the deck of the carrier and attached to a notch in the catapult forming a distinctive “V” shape.<sup>5</sup> When fired, the plane would receive an additional boost of speed on takeoff from the catapult's connected lanyard, enabling it to reach the speeds necessary to achieve flight from the carrier's runway.

For over seventy-five years this bridle system would be used to launch countless planes from the decks of American supercarriers. Over time, bridle catapults increasingly came to be replaced by a launch-bar system that attached to the aircraft's nose gear and which had its components largely run underneath the deck of the ship. The last U.S. carrier to utilize a bridle catapult was the USS Enterprise (CVN-65) which made its way to Naval Station Norfolk for decommissioning on November 4th, 2012—bridle catchers still intact and operational.

While the Navy has shifted away from the use of a lanyard-based system to help launch planes, the same cannot be said for the process of securing the safe landing of those same aircraft. The use of wire rope lanyards to rapidly slow the landing of aircraft on the deck of a Navy carrier is essential. There are, depending on the size of the ship, three or four of these wire rope lanyards, known as arresting cables, on every carrier in the Navy.<sup>6</sup> On each carrier, one of these arresting cables is the “hit cable”, the lanyard designated as the primary to catch the planes of landing pilots which once more denotes the importance of using only the strongest, most well-made wire rope lanyards from experienced manufacturers for use in military applications.



## ◆ Military Humvee

The Humvee, known by its military designation as the High Mobility Multipurpose Wheeled Vehicle (HMMWV), is a lightweight tactical vehicle that is used to transport troops as well a wide variety of military hardware. A remarkably adaptable vehicle, the Humvee is used by the military in 15 different configurations including as a cargo and troop carrier, weapons carrier, ambulance, and an anti-tank missile launch platform.

The versatility of the Humvee can be largely attributed to its unique design which features 44 interchangeable parts that can each be used in multiple positions and combined to form numerous configurations.<sup>7</sup> With such a large number of modifiable components and designed for use on the battlefield, the need for soldiers to be able to quickly and safely adjust a component on the Humvee is crucial. This necessity is the reason that wire rope lanyards remain a vital design component in military Humvees. The ability of wire rope lanyards to facilitate rapid, reliable adjustments to both vehicle components and secured weaponry, whether interior or exterior, makes them an integral part of the Humvee's multi-faceted operations during armed conflicts. The versatility of the Humvee, thanks in no small part to its use and implementation of wire rope lanyards, is why over 10,000 HMMWVs were employed by coalition forces during the Iraq War and why the vehicle has continued to serve the armed forces for over 35 years.<sup>8</sup>

## ◆ Conclusions

The uses of wire rope lanyards throughout the branches of the military are as wide as they are varied. From aiding paratroopers as they leap out of high-altitude aircraft, to catapulting and catching fighter planes on the decks of naval supercarriers, to transporting troops and equipment across the rough terrain of the battlefield, wire rope lanyards comprise an important facet of the American soldier's military kit—helping keep them safe and secure in even the most harrowing situations.

A ubiquitous and perhaps too commonly overlooked component, wire rope lanyards are nevertheless a crucial and indispensable part of the modern military. In that same vein, the choice of supplier for wire rope lanyards is equally critical. Only cable assembly manufacturers, like Lexco Cable Manufacturing with their exceedingly high standards, decades of experience, proper certifications, and the ability to make specialized products or offer specialized finishes, treatments, or coatings should be considered when sourcing a wire rope lanyard supplier for the military.



## ◆ Work Cited

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<sup>8</sup> Warner, Fara (25 December 2003). "Army Stepping Up Its Humvee Orders For Troops in Iraq". The New York Times. Archived from the original on 19 January 2019. Retrieved 18 January 2019.

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