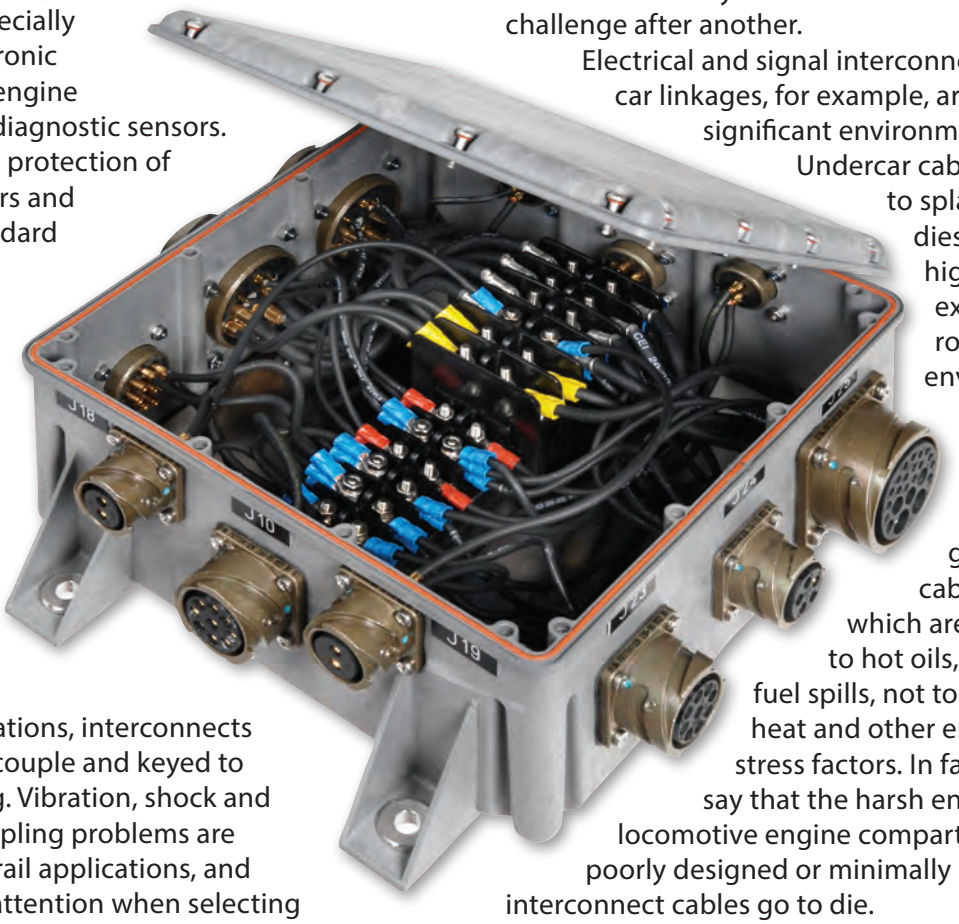
Connectors, Cables and World-Class Interconnect Expertise Arriving Now on Track 5015!

At their most basic level, rail system interconnect design challenges are similar to other transport modes. Reducing weight is a critical issue, especially for high-speed and Maglev rail systems. Shielding electromagnetic interference is important, especially in sensitive electronic systems such as engine monitoring and diagnostic sensors. Basic mechanical protection of cables, conductors and contacts is a standard requirement especially when frequent mating and unmating is required, or when cables are routed through exposed intercar or undercar locations. To ensure rapid and accurate car linking and cabin reconfigurations, interconnects must be easy to couple and keyed to avoid mis-mating. Vibration, shock and connector decoupling problems are also common in rail applications, and require focused attention when selecting shell materials and mating technologies. As passenger and crew safety is paramount—interconnection systems must not compound flammability, smoke or toxicity risks.



But make no mistake: the overriding challenge is environmental. Rail and transportation systems represent one of the most challenging environments for the long-term survivability and reliability of interconnect cables and assemblies. From high-speed rail transportation systems to heavy railway freight lines, the standard daily fare of the rail industry is one harsh environmental challenge after another.

Electrical and signal interconnections in rail car linkages, for example, are subject to significant environmental abuse. Undercar cables, exposed to splashing, mud, diesel exhaust and high heat, require extremely robust environmental protection. Locomotives are brutal testing grounds for cable systems which are subjected to hot oils, solvents, and fuel spills, not to mention high heat and other environmental stress factors. In fact, it's fair to say that the harsh environment of a locomotive engine compartment is where poorly designed or minimally protected interconnect cables go to die.

For this reason, the art of designing rail industry interconnect cables that provide long-life and value depends on a comprehensive understanding of the environmental stress factors that can, at a minimum, diminish performance, and at their worst lead to complete system failure. Glenair is an

expert in the design of cable, box and conduit wire protection systems that prevent environmental damage and ensure longevity of service. The design and manufacture of environmentally sealed connectors, backshells and other components that keep interconnect systems free of corrosion has been our bread-and-butter business for over 50 years.

This catalog presents one of the core Glenair interconnect technologies that is specifically geared for use in rail systems, agricultural equipment, military vehicles and other harsh, environmental applications. Glenair Series ITS and ITS-RG connectors are perfectly suited to address every rail industry interconnect challenge. These ruggedized, MIL-DTL-5015 Type reverse bayonet connectors are deployed in virtually every rail industry sub-system including:

- Automatic Train Control (ATC) Systems
- High Temperature Engine Controls and Sensors
- Speed Sensors
- Diagnostics
- Braking Systems

Urban and inter-urban rail systems are ideally suited for ruggedized 5015 type connectors.

Connectors and cables see tough, environmental duty in rail applications. Poorly sealed products, or those made from inappropriate materials, can lead directly to system failures. Glenair Series ITS and ITS-RG are designed for the most severe environmental applications—from rail cars to military vehicles.

- Anti-skid Systems
- Traction Motors
- Converters
- Couplers
- Pantographs
- Electronic Monitoring and Diagnostic Systems
- Intracar/Intercar/Undercar Cabling Systems
- Radar and Rail Navigation Systems
- Radio Communications Systems
- Data Systems
- Rail Car Lighting and Security Systems
- Climate Control for Passengers and Freight
- Battery Chargers
- Door Control Systems
- Equipment and System Bonding Systems
- Cabin Video, Phone, and Internet Systems
- Way-Side Signaling
- Track Controls
- Trackside Safety Systems

Glenair®

Glenair Series ITS and Series ITS-RG MIL-DTL-5015 Type Reverse Bayonet Connectors Product Selection Guide

Turnkey Series ITS and ITS-RG Wired Cable and Conduit Interconnect Assemblies

The Glenair ITS connector series features over 200 power and signal insert arrangements. Based on the MIL-DTL-5015 standard, ITS features an improved reverse bayonet coupling technology in place of the standard threads used in MIL-DTL-5015. The 3-point bayonet mechanism reduces coupling time and provides easier mating, especially when the connector is in an awkward position. Positive locking of the three stainless steel pins provides reliable resistance to vibration and shock, and prevents connector de-coupling in even the most rugged applications such as locomotives, mass transit cars and military vehicles. Bayonet pins are protected from damage by their placement inside the plug coupling nut, and the receptacle's exposed ramps are easy to clean in harsh environments. Extremely durable, the reverse bayonet coupling is rated to 2,000 matings.

On new applications, as well as retrofits of existing systems, manufacturers face contractual penalties for system "down-time", or late deliveries. Cost-conscious designers are therefore motivated to choose interconnects and interconnect cabling that deliver reliable turnkey performance. For this reason, high-reliability suppliers like Glenair—whose products take into account the total cost-of-ownership over the full life of the system—are increasingly sought out for turnkey cable design and fabrication.

In addition to our work designing interconnect products for new rail applications, Glenair has a long track-record of solving problems in existing systems undergoing periodic mid-life overhauls. During the overhaul process designers sometimes take the opportunity to enhance functionality and improve performance in interconnect cabling. Often these design improvements require changes in connector hardware, as well as the wire protection media. When retrofitting existing locomotives or military vehicles, switches, gages, indicators and sensors must fit into existing control panel real estate. Consequently, overhaul designers sometimes require reduced interconnect package size or better solutions for the routing and attachment of cable harnesses. Glenair is well positioned to assist in this work as we are the only manufacturer in the business that both produces the individual interconnect components, as well as complete wiring and cabling services.

U.S. CAGE Code 06324 Printed in Italy

Military Vehicle Applications

Standard ITS inserts are made from neoprene, but high temperature silicon or solvent-resistant elastomer inserts can be specified. Series ITS connectors can be ordered with a flame retardant compound that significantly reduces fire hazards, and meets smoke density and toxicity standards.

The Glenair Series ITS-RG Connector is a unique, ruggedized rubber-coated version of the Series ITS designed for use in harsh environmental applications. Offering the same electrical performance as the standard ITS, the ITS-RG has better insulation from high current and voltage. The rubber covering also allows for easier gripping and handling, prevents shell damage, eliminates fluid infiltrations and guarantees a Protection Index of IP67. The rubber coating conforms to the strictest safety norms regarding fire resistance, toxicity and smoke including ASTM C542, ASTM E662/83 and CEI 20.37/85.

Glenair ITS-RG Connectors are designed for easy handling in harsh military applications.

Extremely versatile, Glenair's Series ITS connector has been specified in a wide range of rail and military vehicle applications including command and control systems, brakes, converters, door-opening systems, pantographs, data and communication systems, couplers, speed sensors, diagnostics, anti-skid devices, lighting, and intervehicle coupling connections.

Next Generation Military Vehicles

The latest generation of military vehicles are as sophisticated as commercial jets. New command and control panels are as jam-packed with systems controllers, sensors, gauges, and equipment as any modern airplane cockpit. The power and signal linkages within and between the electronic systems in a modern military vehicle constitute one of the more complex interconnect cabling systems in existence. The interconnect cables used to service weapons systems, targeting, radio communications, and soldier recharging services, phone and Internet, rival in complexity those found in the most sophisticated fighter jet.

Glenair Series ITS and ITS-RG connectors and cables are designed for use in the most demanding power and signal interconnect applications, and have been selected for use in countless military vehicles, shelters and other tactical applications.