



The patented **SONOGRIP**[®] plug system has been designed feature by feature to address the predominant causes of field failures in the “trailer jumper cable”.

Most Common Causes of “Light-Cord” Failures

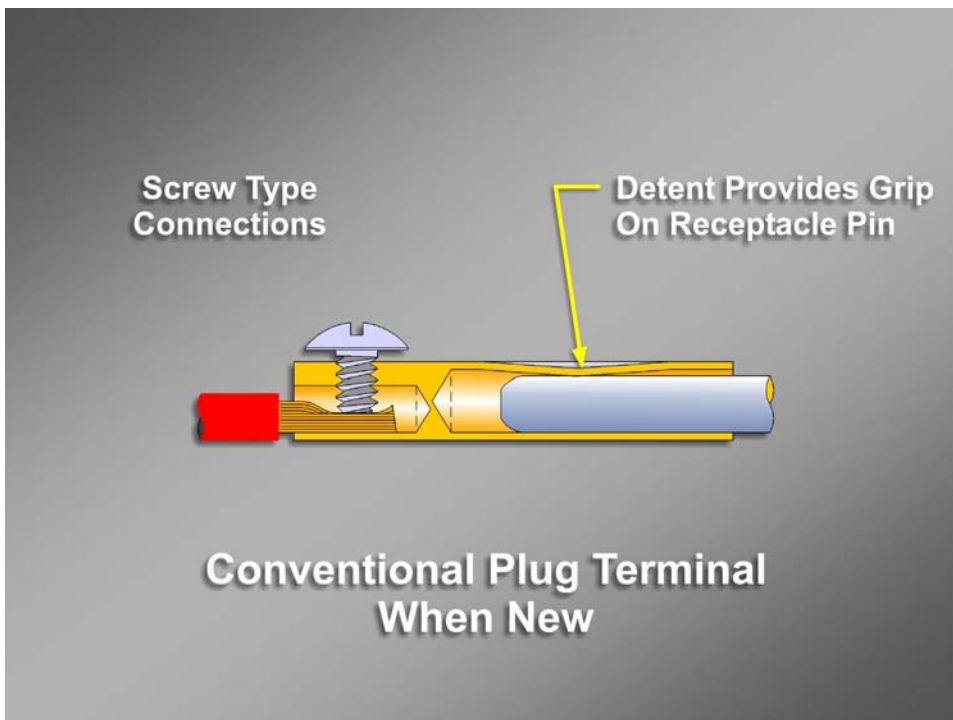
- LOOSE PLUG PIN GRIP
- LOOSE WIRE CONNECTIONS
- CORRODED WIRE CONNECTIONS

Discounting those cables that failed after having been tangled with drive lines, specified too short for the job, or otherwise abused, the most common causes of “light cord” failures were found to be ...

- Loose “grip” on the receptacle pins ...

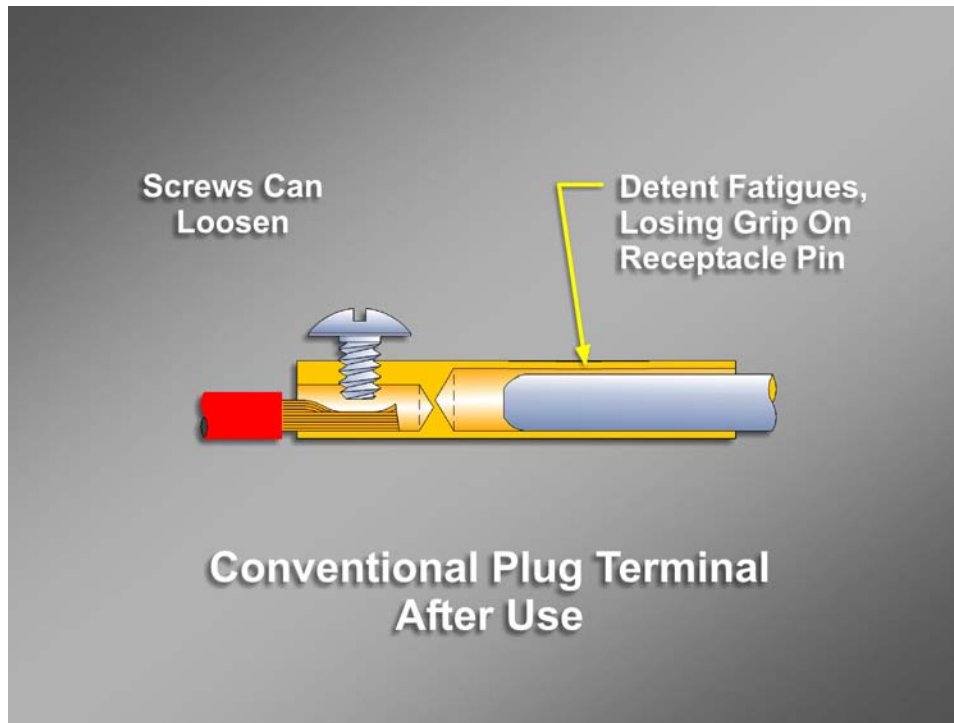
- Loosening of the wire to plug terminal connection, and ...
- Corrosion in the wire to plug terminal connection

All of which result in increased lamp and connector maintenance costs, as well as the obvious safety issues.



Why do these failures occur? In this schematic cross-section, we can see the construction of a conventional plug terminal. The grip on the pin is provided by deflecting a portion of the

“barrel” to provide an interference fit with the receptacle pin. A copper alloy is used to provide good electrical characteristics, however, these alloys lack good spring characteristics.



With plugging & unplugging, and the weight of the swaying cable, the interference detent fatigues too quickly - losing its spring grip - resulting in loose connections with the pin.

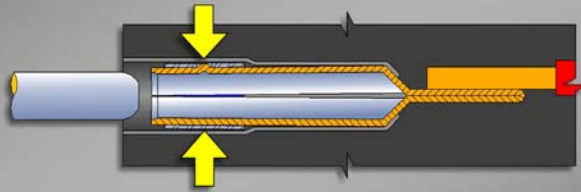
Attempts to restore the fit by spreading split style receptacle pins are short lived, and, when the pins break, result in the replacement of the receptacle as well as the plug.



As we look at this cut-away view of the patented **TRAMEC** SONOGRIP® plug, the differences begin to show. Looking

first at the open end of the plug, you can see the female terminals, banded by a radial spring.

Radial Spring Provides Long Life Grip

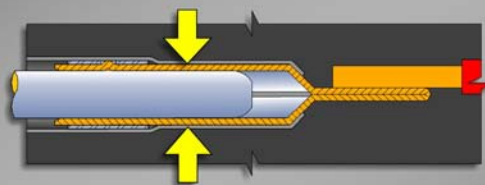


SONOGRIP[®] Terminal

The copper alloy of the terminal stamping provides good electrical properties, while the surrounding band of high-

temperature stainless steel spring material provides long life to the fit with the mating pin.

"Clam Shell" Design Provides Full Contact

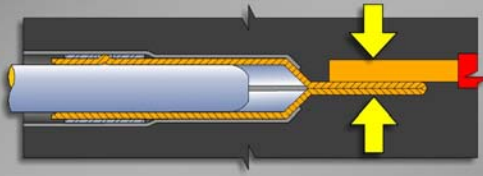


SONOGRIP[®] Terminal

The "clam-shell" construction of the terminal provides contact along the full length of the pin. The SONOGRIP[®] connection provides reliable electrical performance that is maintained

throughout the SAE J560 durability test, which requires two salt spray tests interspersed with 5000 coupling/uncoupling cycles.

Ultrasonic Welded Terminal Connection



SONOGRIP® Terminal

Moving back along the plug terminal, we come to the most significant feature of the SONOGRIP® plug - the wire to terminal connection.

Each conductor wire is ultrasonic welded to the terminal, forming a single element.



SONOGRIP®

- Ultrasonic Welding
- No Mechanical Connections
- No Corrosion Between Wire & Terminal

Welding the conductor and terminal eliminates mechanical connections, such as crimping or screw terminals, that can loosen with vibration and thermal shock.

Corrosion can not develop between the wire and terminal because they are fused into one.



After the terminals are welded to the conductor wires, they are loaded onto a mandrel and encased in shrink tubing. In the patented process, the mandrel pins expand the terminals and hold the terminals to the tight positional requirements of SAE J560 during the injection molding process.

An adhesive sealant is applied to the cable jacket, and the assembly is loaded into the injection die, along with the die

cast sleeve. The injection molding process encapsulates (or pots) the entire assembly - eliminating voids where moisture could collect. The molding process protects the normally exposed ends of the wires to extend cable life.

The metal or nylon sleeve provides extra durability and supports the assembly as it exits the receptacle.

SONOGRIP "XT" Polyurethane Jacket Meets SAE J2222

- Maintains High Temperature Sag Resistance
- Stays Flexible at Extreme Low Temperature
- Has Excellent Cut & Abrasion Resistance
- Excellent Resistance to UV, Ozone, & Chemicals

The **TRAMEC** "XT" polyurethane cable jacket has been formulated to exceed the requirements of SAE J2222 in providing ...

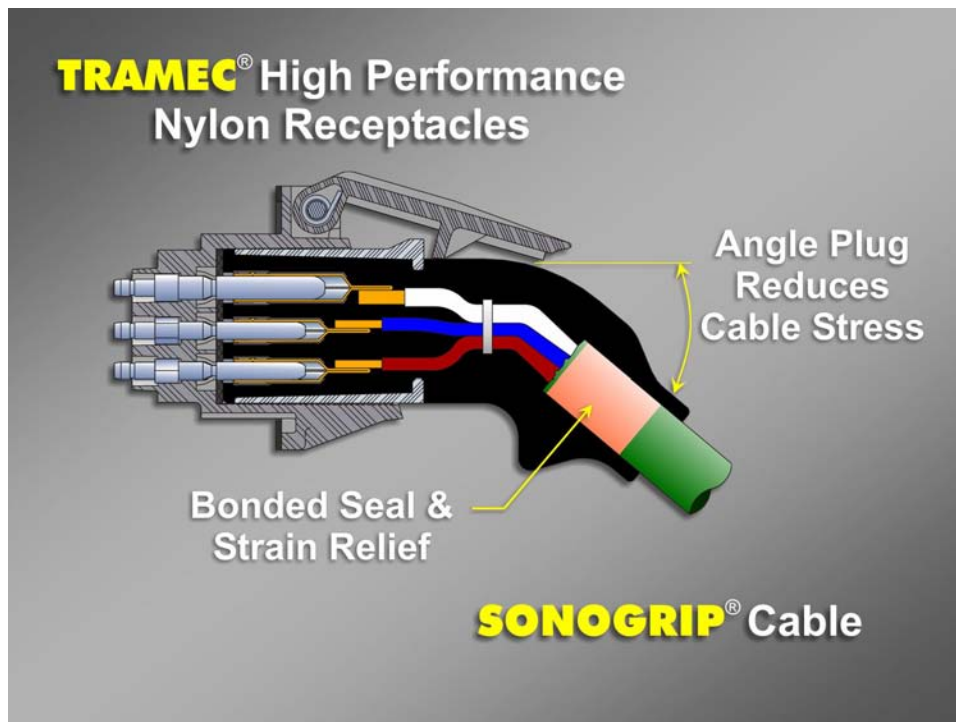
- High temperature sag resistance
- Cold temperature flexibility
- Excellent Cut & Abrasion resistance

- Excellent UV, Ozone, and Chemical resistance.

The conductor wire and cable jacketing are produced in our own extrusion plant, providing vertically integrated control of the materials from the specification of the stranded wire, up through the final product.



The SONOGRIP® cable assemblies exceed the requirements of the latest SAE Standard J560, and are available with conventionally shaped straight plugs or a combination of straight and angled plugs.



The cable jacket is bonded to the elastomeric plug material. This bond prevents moisture from migrating along the jacket into the plug body, and provides strain relief for the conductors. With the angled plug, the exit angle of the cable further reduces stress on the assembly by approaching the natural curve of the extended cable.

Combining the **TRAMEC** SONOGRIP® plug and cable

assemblies with the corrosion resistant design of the **TRAMEC** nylon receptacle family, provides an excellent tool in the fight against voltage drop and flickering lights.

The SONOGRIP® plug is available on both coiled and straight cables; combined with a full range of cable types, end configurations, and lead lengths.