



# RAIL LINE PROJECT FRANCE

## THE DROPPERS

### The Challenge

The French national railway company is a worldwide pioneer regarding development and construction of high speed railway lines. The first high speed line in France, was the LGV South-East, in 1981. Since that first high speed line, the company has consistently focused on improving the reliability and speed of railway lines.

One key area of innovation is the dropper - a key connector of the catenary; it is in charge of distributing the current into the contact wire and maintaining good positioning on the contact wire.

The objective is to allow a high quality contact with the pantograph of the train. With such a fundamental role in overall system performance, improvement of electrical and mechanical behavior of the dropper was critical.

Droppers used for the first high speed lines in France were articulated at upper and lower parts. This design provided good mechanical behaviour. However, this articulation system design led to poor electrical performance of the dropper.

In order to increase the electrical contact between the messenger and the contact wire, a distribution connection was installed every 200 meters (maximum). The weight of this distribution connection was around 1.20 kg. This extra weight could locally bend the contact wire representing a major weak point on the catenary which limited the speed of the train. The national company approached TE Connectivity (TE) to help address this issue and improve overall system performance.

### Country:

France

### Industry:

Railway

### Key figures:

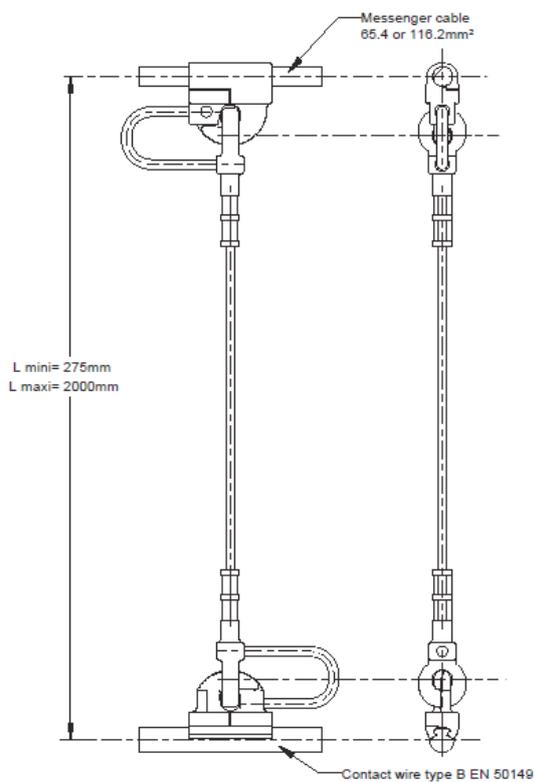
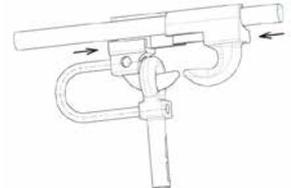
- Installed in the field since 20+ years
- 220,000 parts already in service
- 147,000 droppers will be installed within the next 2 years in France for LGV E.E. and LGV S.E.A. projects

## The Solution

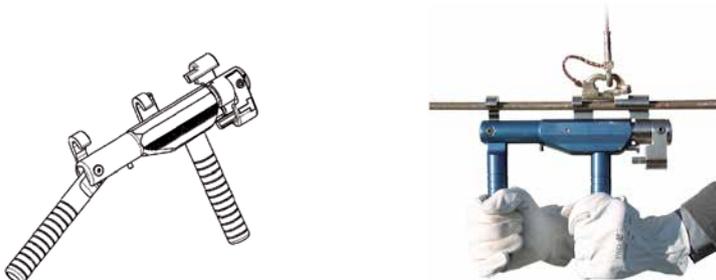
The French rail player and TE engineering staff started to work on a new dropper design which would be a better solution. The first meeting took place in November 1991 with a focus on discussing the design requirements and performance results of the new TE solution.

This innovative connection dropper would provide two mechanical and electrical functions without any screw or bolt. Indeed it would still be articulated at the upper and lower sides in order to warranty a high mechanical behaviour.

However, a binding cable would be added at both sides to make sure to consistently maintain an electrical contact between messenger and contact wires. Connections at each side (messenger and contact wire) would be made by sliding effect between two half clamps.



TE also developed a specific tool named SIMAGRIF which makes the installation easier and more reliable.





## The Outcome

With many years of expertise and experience in designing and supplying products for demanding rail applications, TE Connectivity's Energy business unit worked on designing, testing and manufacturing this new dropper along with this new tool.

TE under the SIMEL brand passed all the qualification tests defined by the French railway company in laboratory and 2,000 droppers were installed on the field between 1995 and 1996 in order to check the performances of the dropper in real conditions. In 1996, SIMEL connection dropper was officially approved.

“TE DEMONSTRATED THEIR STRENGTH IN AN UNCOMMON CONTEXT. THEY CLEARLY POSITIONED THEMSELVES AS A KEY RAILWAY SUPPLIER THANKS TO OFFERING ALL POSSIBLE CONNECTION SOLUTIONS. TE QUALITY EXPERTISE AND SPECIAL UNDERSTANDING OF OUR NEEDS MADE THEM THE BEST CHOICE.”

SIMEL droppers offer high reliability in the field (droppers have been installed for more than 20 years) and high performances. Each connection dropper is supplied to the customer at a defined length. Local assembly in France provides shorter lead times to satisfy customer across the region.

This has allowed TE Connectivity to become a key supplier in France for droppers especially for High Speed Rail (HSR) projects. SIMEL droppers are installed on the vast majority of existing high speed lines in France. In fact, SIMEL connection droppers were used when TGV Est beat rail speed record (574.8 km/h) in April 2007. They have also been installed in the UK, Belgium, Greece and Korea.

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