White paper

The challenges of LPG transport: safety & optimal loading capacity

www.larco.fr

The transport of LPG (Liquefied Petroleum Gas) is a strategic sector that meets a growing energy demand. Used in many areas—such as industry, domestic heating, and transportation—LPG offers significant advantages in terms of energy performance and reduced environmental impact compared to traditional liquid hydrocarbons. However, its liquefied and pressurized nature imposes strict requirements for storage and transport, raising several challenges for transport operators.

Transport precautions

LPG has a high thermal expansion capacity. When the ambient temperature rises and when the liquid is agitated during transport, part of the liquid turns into gas, which leads to an increase in pressure inside the tank. If there is insufficient expansion space due to overfilling, the pressure can reach a critical level, threatening the integrity of the tank and increasing the risk of uncontrolled vapor release or explosions.

Conversely, underfilling reduces the profitability of transport, as each trip becomes less efficient in terms of delivered volume. Transport operators must therefore constantly balance two conflicting objectives:

- Maximize profitability by optimizing tank filling volumes.
- Ensure safety by adhering to regulatory filling limits and avoid overpressure risks.

Solutions for monitoring and optimizing the filling of LPG tankers

Currently, two main types of equipment are used to monitor the filling of LPG tankers:

- **Weighbridges**, which allow the truck to be weighed before and after loading to verify the transported volume.
- **DOCIL 510 probes**, an onboard technology developed by LARCO for more precise and efficient filling management.

Optimizing filling volume while ensuring transport safety

Our Comparison:

−

Weighbridge

The weighbridge is a traditional method that provides an estimate of the transported volume based on the weight difference before and after filling.

Although this solution is still used, it presents several drawbacks:

- A longer process, requiring multiple weight measurements and repeated loading steps to reach the desired balance.
- A risk of exceeding the safe filling threshold, which may require a volume adjustment procedure.
- Maintenance-related costs and downtime associated with this type of equipment.

+

DOCIL 510 probe

- Optimizes the loading process while maintaining a safe gas phase.
- Enables better filling management.
- Increases the profitability of LPG transport.

Operating principle:

The 510 probe is equipped with two sensors connected to an electronic device located on the loading platform, which controls the reduction of the loading flow until its complete shutdown.

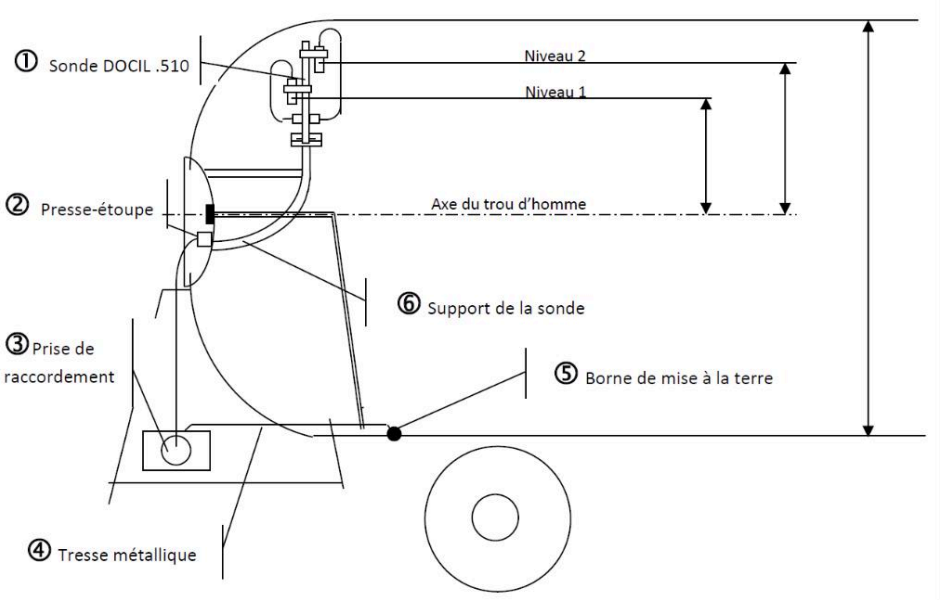

Diagram of the Docil C 510 probe installation

A concrete impact on LPG truck productivity

Designed over 20 years ago and made mandatory by national regulations in France, the DOCIL 510 probe now equips more than 200 trucks across Europe, as well as in New Caledonia and the Caribbean, delivering significant gains in speed and efficiency for transport operators.

Thanks to its two-level detection system, which allows the adjustment of the final loading flow rate, it enables optimized filling without the risk of overpressure—combining performance, safety, and regulatory compliance.

Interested in the DOCIL 510?

contact@larco.fr

+33-1-39-47-12-22

www.larco.fr