Tri-Lift – High-Impact Downhole Spring Longevity Case Study

Executive Summary

Tri-Lift high-impact titanium downhole springs demonstrated exceptional longevity across two multi-year field deployments. Both the TED-5 (2 3/8”) and Phenix-2 (2 7/8”) systems maintained coil integrity, structural stability, and corrosion resistance after nearly three years of continuous plunger-lift operation.

Model	Tubing Size	Install	Pull	Runtime	Plunger System
TED-5	2 3/8"	4/7/2023	11/22/2025	~960 days	4-slot dart bypass
Phenix-2	2 7/8"	3/6/2023	11/23/2025	~992 days	12" sleeve + tungsten ball

TED-5 (2 3/8”) Spring Durability



The TED-5 spring retained its original coil pitch, showed no signs of fatigue, and exhibited clean, uniform wear after ~960 days. No deformation, corrosion, or compression scarring was observed.

Phenix-2 (2 7/8”) Spring Durability



The titanium fishneck showed divoting from tungsten ball strikes but no swelling or material displacement—proving high impact resistance. Coils remained true with no fatigue signatures, and the flow cage exhibited only normal polishing. The lower cup was torn during retrieval, not during production.

Conclusion

The combined data from these long-duration deployments confirms Tri-Lift’s titanium spring systems deliver exceptional multi-year downhole durability. Springs maintained structural integrity, reduced maintenance cycles, and provided reliable performance under high-cycle plunger lift conditions.