SAFETY | ENGINEERED SOLUTIONS | MINING

COOPER FLUID SYSTEMS

CASE STUDY

Nitrogen/Helium suspension system service tooling skid

ENGINEERED FOR SAFETY, EFFICIENCY AND LONG-TERM VALUE

“Cooper Fluid Systems partnered closely with site-based maintenance teams to design a fit-for-purpose Suspension Service Tooling System solution prioritising safety, efficiency, site compliance, and long-term asset value.

This case study outlines the engineering journey from problem assessment to solution development, including key design enhancements and the rationale behind a custom-built suspension service station for modern mining operations.”

THE CHALLENGE

The site’s existing nitrogen/helium suspension servicing equipment was outdated, unengineered, and no longer aligned with current mining safety and operational standards. Tooling relied on basic gas bottle trolleys, site-made hoses, manual tap systems, and separate oil drums.

Key challenges included:

- Safety risks from uncontrolled gas and oil pressurisation at pressure up to **1,200 psi.**
- Excessive gas wastage due to pressure equalisation and inability to fully recover bottle contents.
- Inefficient servicing processes, increasing maintenance time and equipment downtime.
- Limited scalability to support evolving fleet requirements and compliance obligations.

With increased focus on suspension maintenance to improve asset reliability and mitigate chassis cracking, an engineered solution was required to enhance safety, efficiency, and long-term operational compliance.

THE SOLUTION

Cooper Fluid Systems worked closely with site supervisors and tradespeople to redesign the suspension service stations from the ground up, resulting in a skid-mounted Gas Service Station compatible with major OEM platforms.

Key design principles included:

- Improving operator safety and control during high-pressure operations.
- Optimising gas utilisation and minimising waste.
- Reducing servicing time and consumable use.
- Delivering sustainable operational efficiencies and long-term cost savings.
- Achieving a strong 5-year return on investment (ROI) through improved gas storage management, utilisation, and reduced wastage.

KEY ENGINEERING IMPROVEMENTS

Increased Gas Capacity

The four-cylinder configuration provides up to **eight times greater usable gas capacity**. An integrated pump and manifold system enable simultaneous cylinder use, reducing changeovers, minimising gas wastage, and improving overall efficiency.

Enhanced Oil Capacity and Serviceability

A purpose-designed **450 L oil reservoir** (up from 60 L) supports uninterrupted full-suspension servicing without the need for frequent refills. An integrated sight gauge ensures accurate additive mixing and simplifies lube bay operations.

Safer, More Stable workstation

The forklift-compatible skid with a weight-balanced frame improves stability, mobility, and transport while reducing manual handling. An automated safety gate system further enhances operator safety.

Upgraded Hose, Pump and Controls

Air-operated hose reels eliminate hose recoil risks, a heavy-duty oil pump improves durability, and high-precision lever-operated control valves provide greater accuracy, control, and user-friendly operation.

Charging Adaptor Kits

Model-specific charging kits ensure correct fittings and maximise gas utilisation and improve service consistency while reducing downtime.

THE RESULT

- Enhanced operator safety during high-pressure servicing.
- Increased equipment uptime with less consumable waste.
- Improved compliance with current mining safety and operational standards.
- Greater flexibility across fleets and site requirements.

> **“A bespoke solution delivering improved operational efficiency, extended asset service life, and measurable cost savings through reduced gas consumption and waste.”**

THE COOPER FLUID SYSTEMS COMMITMENT

At Cooper Fluid Systems, we combine engineering expertise with operational insight to deliver practical, safe, and commercially viable solutions. By working closely with end-users, we engineer solutions that meet the demands of real-world mining operations.

THIS PROJECT DEMONSTRATES OUR COMMITMENT TO:

- Engineering excellence and safety-led design
- Practical solutions for site-based maintenance operations
- Lower operating costs through improved efficiency and reduced waste
- Tailored solutions for demanding mining environments

COOPER FLUID SYSTEMS

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