

# Certified Steer Cylinder Upgrade



**SWANSON**<sup>®</sup>  
INDUSTRIES



# KOMATSU 830/930E STEER CYLINDER

- ✓ MDG41 Guideline for fluid power safety at mines.
- ✓ AS3990 Mechanical Equipment - Steelwork

Upgraded Barrel.  
Single weld design.



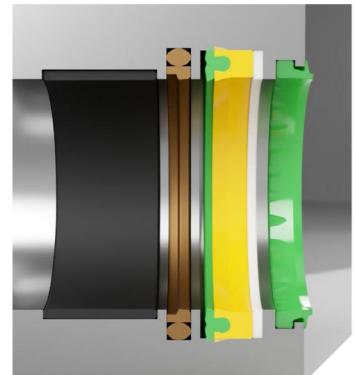
A steer cylinder provides critical hydraulic steering control in Komatsu 830/930E haul trucks, maintaining precise response under extreme Australian mining conditions and heavy loads.

Swanson's upgraded steer cylinder delivers a safer, more reliable solution for Komatsu 830E and 930E haul trucks. Designed to withstand extreme Australian mining conditions, our enhanced cylinders provide improved performance, reduced risk of failure, and extended service life. By incorporating precision engineering and advanced upgrades, Swanson ensures every cylinder meets the highest standards of safety and durability, keeping your fleet operating with confidence and efficiency.

All our work adheres to MDG41 and AS3990 standards, ensuring certified parts meet rigorous Australian mining safety requirements. Our advanced machining capabilities guarantee components exceeding original specifications whilst minimising downtime and maximising fleet efficiency.



## Seal Kit Upgrade



### KEY UPGRADES:

- Wiper:** 820-Umbrella style (361 material) - superior tough condition performance
- Rod Seal:** 3/8" High Temp Polyurethane with HNBR energizer (135-150°C) + Acetal backup
- Buffer Seal:** R16 with Viton energizer - heat resistant, low friction, pressure spike protection
- Piston Seal:** HNBR energizer (150°C) - prevents compression set
- Static Seal:** 90 Duro Viton O-Ring (200°C) Teflon backup (260°C) - heat/extrusion resistant

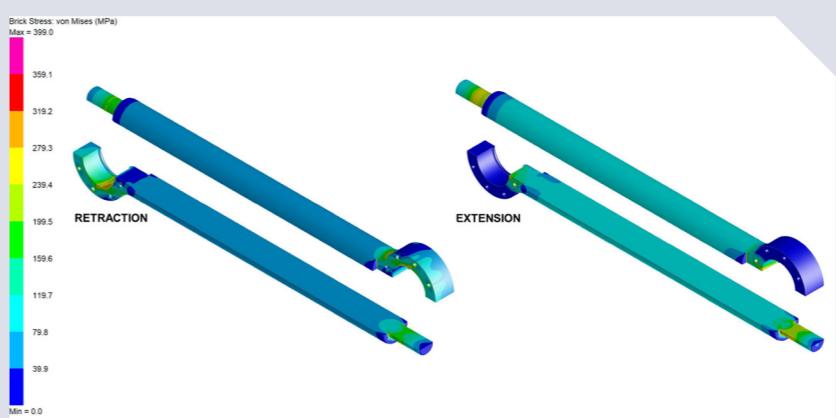
### BENEFITS:

- > Temperature resistance up to 260°C
- > 700 bar pressure rating
- > Compression set resistant
- > Pressure spike protection
- > Enhanced durability

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## One Piece Rod and Clevis



Our certified cylinder rods operate at maximum 3000 psi pressure, manufactured to AS3990 Mechanical Equipment - Steelwork standards.

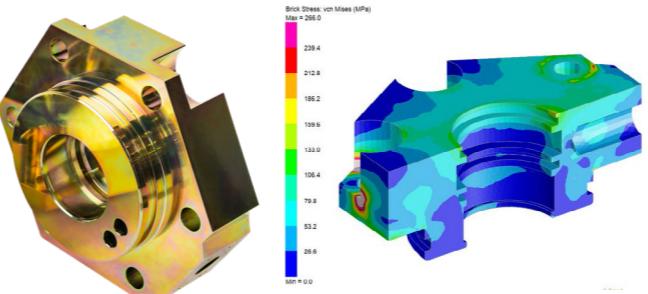
### Specifications:

**Material:** AS 1444/4140(T) steel  
(665 MPa yield, 850 MPa tensile strength)  
**System pressure limit:** 3000 psi

### Comprehensive Testing & Analysis:

Each rod undergoes rigorous validation including rod loading tests, compressive and buckling load assessment, bending stress analysis, tensile rod stress evaluation, and advanced Finite Element Analysis (FEA) to ensure structural integrity under operational conditions.

## Steer Gland Design



**Maximum Pressure:**  
3000 psi

**Safety Standard:**  
Follows MDG41 mining equipment guidelines

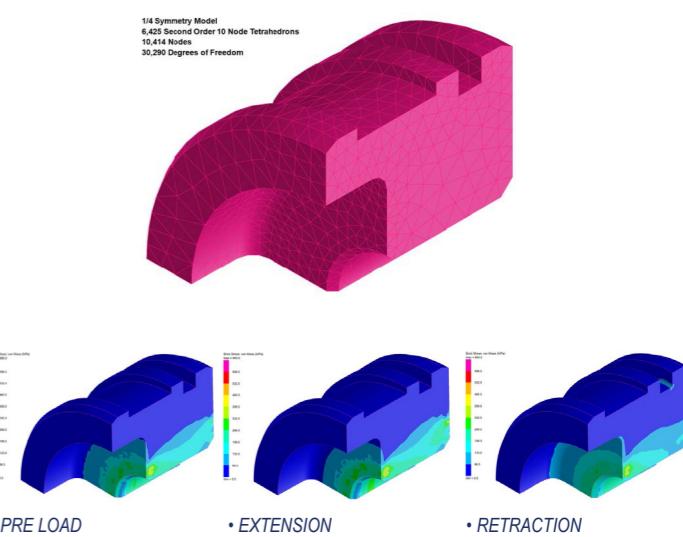
**Pressure Control:**  
System safety valve have limit pressure to 3000 psi max

**Summary:**  
Comprehensive tests confirms this mining truck hydraulic component meets and exceeds strict safety standards for high-pressure operation.

## Cylinder Piston

Our manufactured steer cylinder pistons are rated to 3000 psi maximum pressure and assessed under MDG41 Guidelines for mining fluid power safety.

Each piston is tested for loading, preload, extension, and retraction to ensure compliance with Australian mining safety standards and reliable operational performance.



### Why the design works (engineering rationale)

- Seal system:** High-temp materials and an advanced design handle pressure spikes and reduce contamination.
- Single-weld barrel:** Minimises stress risers and improves fatigue performance under cyclic steering loads.
- Heavy-duty gland:** Larger bearing length and improved seal kit stabilise the rod, protecting seals at high side-load.
- One-piece rod & clevis:** Eliminates weld, maintaining alignment and reducing side-load on gland bearings.

Resulting in a safer, more robust, and reliable cylinder with extended cylinder life

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# Case Study

## Komatsu 830E/930E Trucks

Several open cut mines were experiencing premature steer-cylinder failures on Komatsu 830E & 930E trucks, driven by heat, pressure spikes, contamination and repair-quality variability. We delivered a certified upgrade featuring a heavy-duty sealing system, a barrel with single-weld design, a reinforced gland and a one-piece rod and clevis. The result was a step-change in reliability, safety, and life-of-component, reducing unscheduled downtime and total cost of ownership.

### THE CHALLENGE

- > Open-cut mines experienced recurring steer cylinder failures causing: Premature leaks and rod damage from heat, pressure spikes, and contamination
- > Unplanned shutdowns and increased maintenance costs
- > Critical failure: clevis separation from rod due to poor repair quality



### OUR CERTIFIED SOLUTION

#### Advanced Seal Kit:

- > 820 umbrella-style wiper (361 material) for contaminated environments
- > High-temperature polyurethane rod seal with Acetal backup rated to 700 bar
- > R16 buffer with Viton energiser for pressure spike protection
- > HNBR piston seal (150°C) and Viton O-rings (200°C) with PTFE backup

#### Structural Upgrades:

- > Single-weld barrel design for improved integrity
- > One-piece rod and clevis eliminating joint weaknesses
- > Heavy-duty gland with enhanced contamination control
- > Certified upgrade suitable for Komatsu 890E/930E steer cylinders

### CUSTOMER BENEFITS

- Step-change improvement in reliability and component life
- Reduced unscheduled downtime and maintenance costs
- Ex-stock availability with ISO 9001 quality controls



#### Customer Feedback:

The upgraded Komatsu 830E steering cylinders from Swanson Industries Australia have resolved long-standing issues across our truck fleet. Previously, we faced high costs from early-life failures and significant downtime for replacements.

Key improvements include the one-piece cylinder rod design, eliminating a common failure point, and upgraded seals, which have reduced premature failures from debris, pressure spikes, and heat.

After successful evaluations and in-pit trials, we are now rolling out these cylinders fleetwide. While full benefits will be realised long term through lower overhaul costs, we are already seeing measurable gains, with zero unplanned events year-to-date, saving both time and money.

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