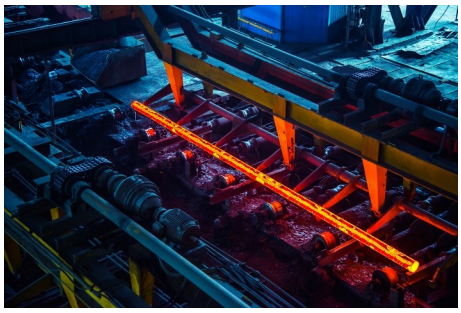
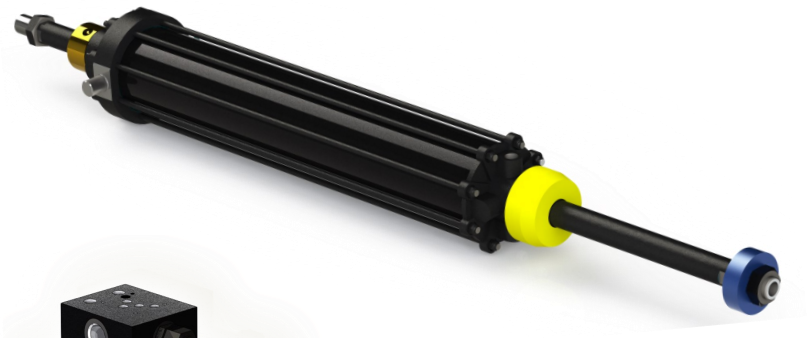
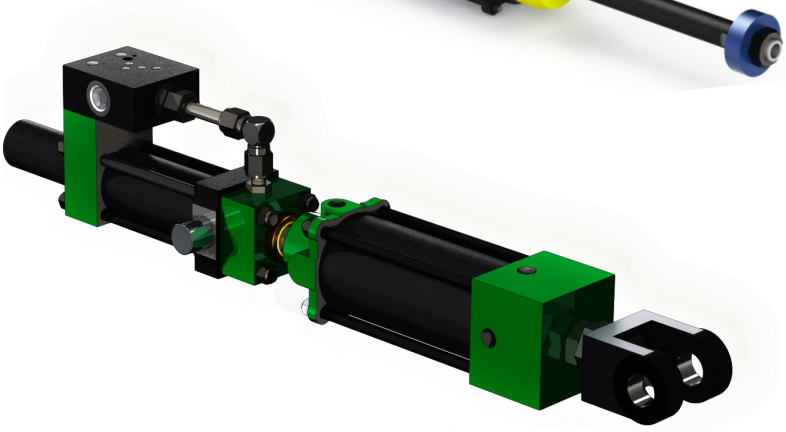
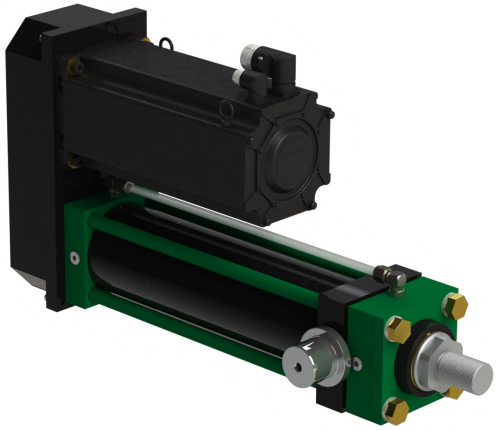
Application Solutions









ROYAL CYLINDERS

Contents

Introduction

Royal actuators have been used in heavy duty applications in the resource industry since 1960. At Royal, our guiding purpose is to solve your cylinder application problems. Using our experience and knowledge we will develop an innovative cylinder solution specifically for you.

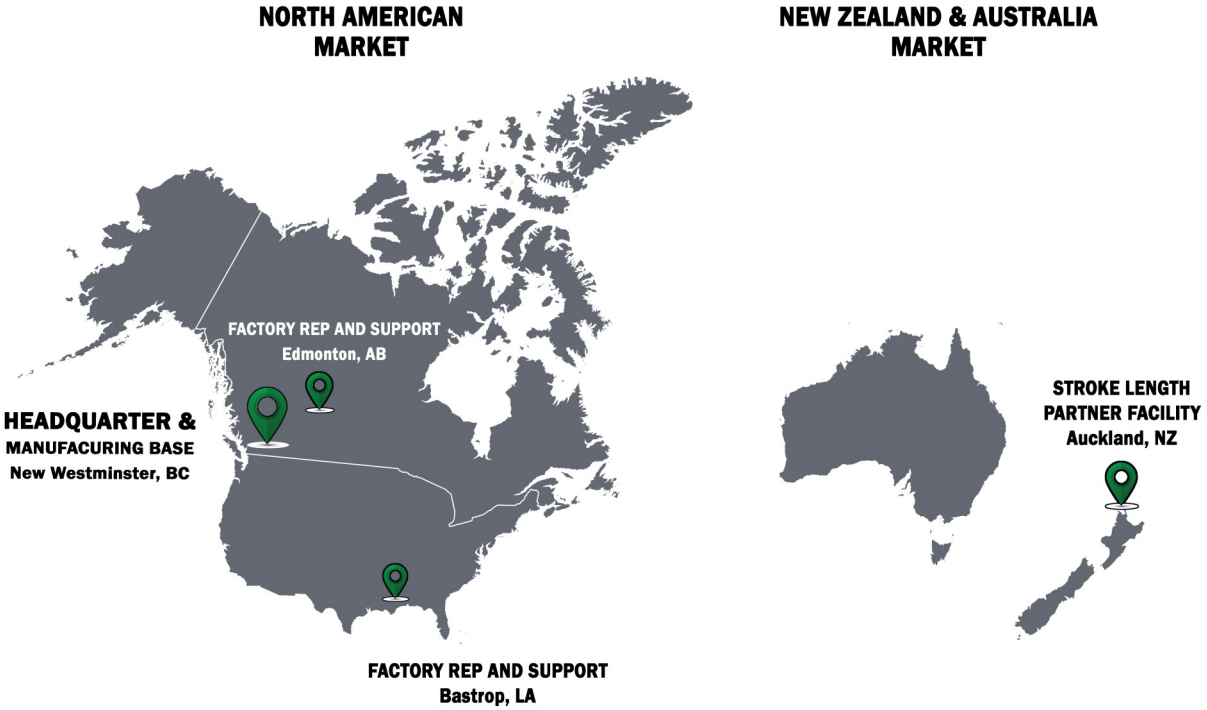
Westcoast Cylinders Inc. manufactures the Royal brand of pneumatic, hydraulic and electric actuators. We specialize in providing dependable, long lasting cylinders that are easy to repair and can be rebuilt indefinitely. Headquartered in New Westminster, British Columbia, Westcoast Cylinders has a reputation as a manufacturer of high quality products that in turn give great value to our customers. We are proud of our long history of providing rugged, durable and easy to maintain cylinders. With our extensive application experience and large catalog of both standard and custom designed cylinders, we will have the solution that will fit your needs.

Royal Advantage

- 60+ years manufacturing experience in heavy industry
- 3000+ custom designs in heavy industrial use
- Support from our engineering, sales and production teams
- Custom cylinders built for specific application and environment
- Extensive catalog of standard pneumatic and hydraulic cylinders

We have designed, engineered and manufactured product for thousands of applications around the world. Royal products are world renowned for having the highest quality workmanship and unrivaled dependability.

Locations



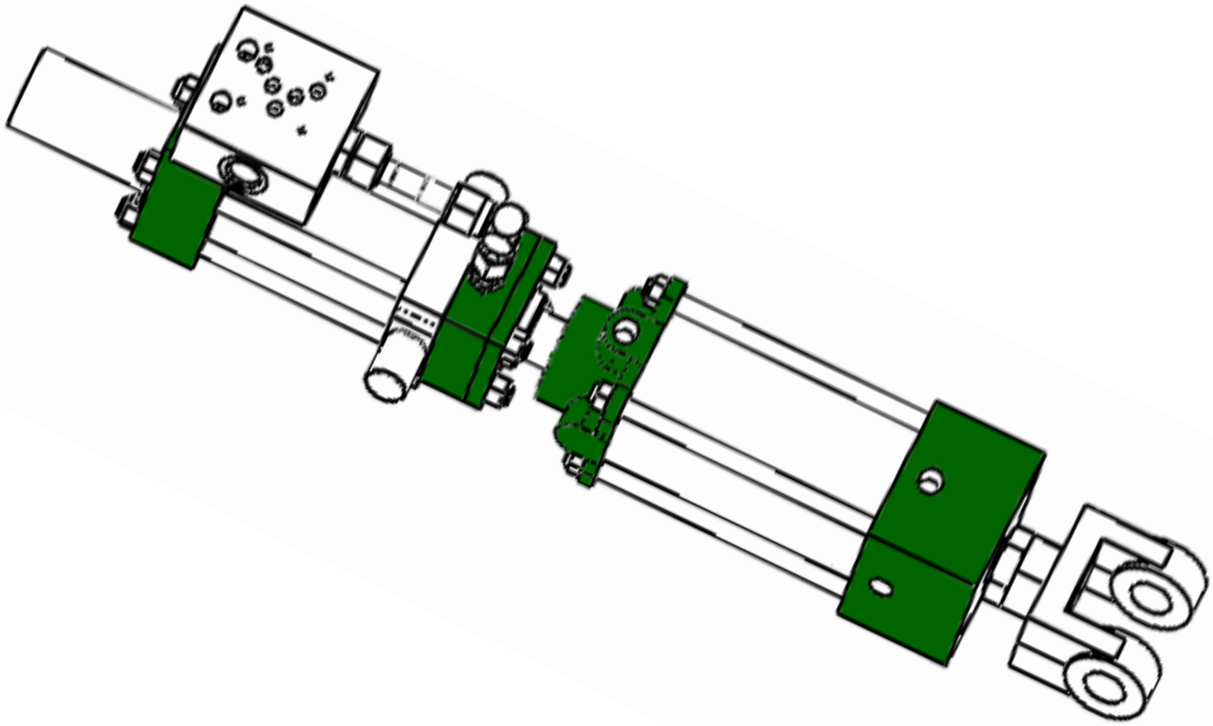
GET THE RIGHT PRODUCT FOR YOUR APPLICATION

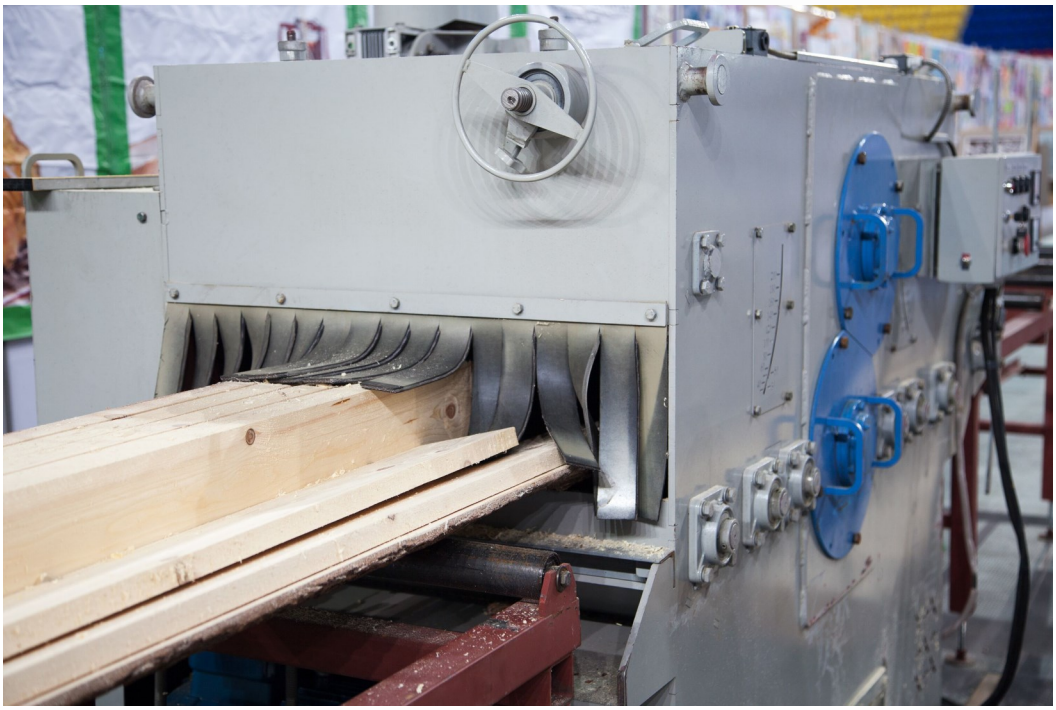
CONSULT	DESIGN	MANUFACTURE	SHARE
Consult with you to understand your application requirements	Design a cylinder with specific features that benefit your application	Manufacture using modern CNC machines to achieve the highest quality finished product	Share our experience and knowledge to develop an innovative solution for you

WOOD INDUSTRY

WOOD INDUSTRY

Pre-Positioning Hold Down Cylinder with Compliance

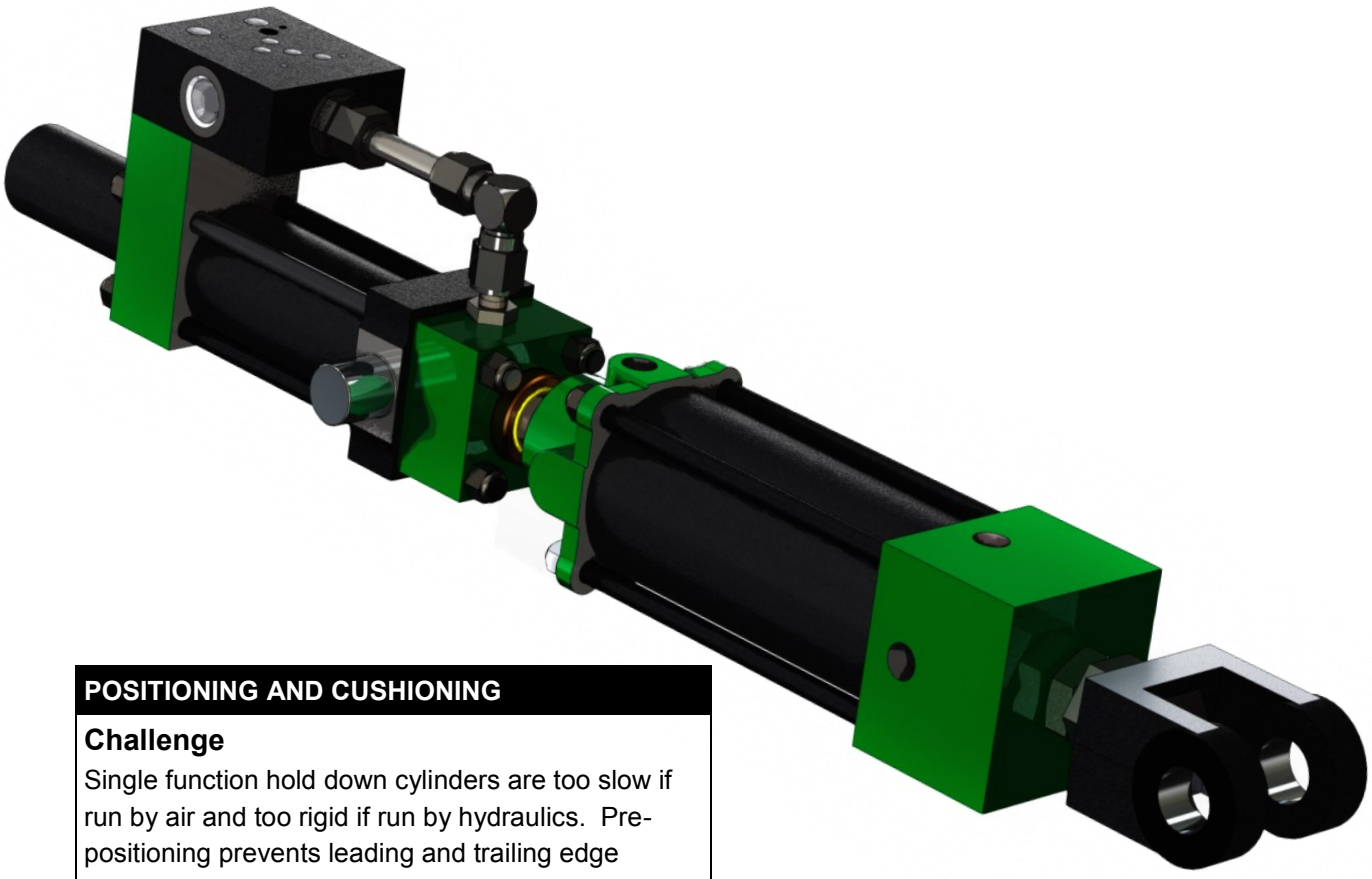




Pre-Positioning Hold Down Cylinder with Compliance

Increase Production Yield with Higher Positioning Accuracy

This combination cylinder provides fast and accurate pre-positioning with a variable hold down force. Pre-positioning reduces the time for the hold down mechanism to get into positon, limits over extension and allows for varied hold down force.



POSITIONING AND CUSHIONING
Challenge Single function hold down cylinders are too slow if run by air and too rigid if run by hydraulics. Pre-positioning prevents leading and trailing edge product damage due to over extension as well as machine damage in the event of product reversal.
Innovation Royal created a hydraulic positioner/air combination cylinder with internal pneumatic cushioning.
Benefit Pre-positioning reduces setting time and the pneumatic cylinder section provides a variable hold down force. This greatly reduces product edge damage and allows for product reversal through the saws without machine damage.

LONGER RUNNING LIFE
Challenge Heavy side load causing premature wear.
Innovation Air cylinder portion is designed to withstand high loads. Cylinder is fitted with extra cushioning, bumpers and a modified gland.
Benefit Longer life with consistent response and force settings.

WOOD INDUSTRY

High Speed Hold Down Cylinder

High Speed Hold Down Cylinder

Extend the time between repairs.

Developed out of the needs of the lumber industry, this is the best hold down cylinder on the market. Key features specifically address the high impact and poor lubrication challenges present in high speed infeed and outfeed wood processing applications.

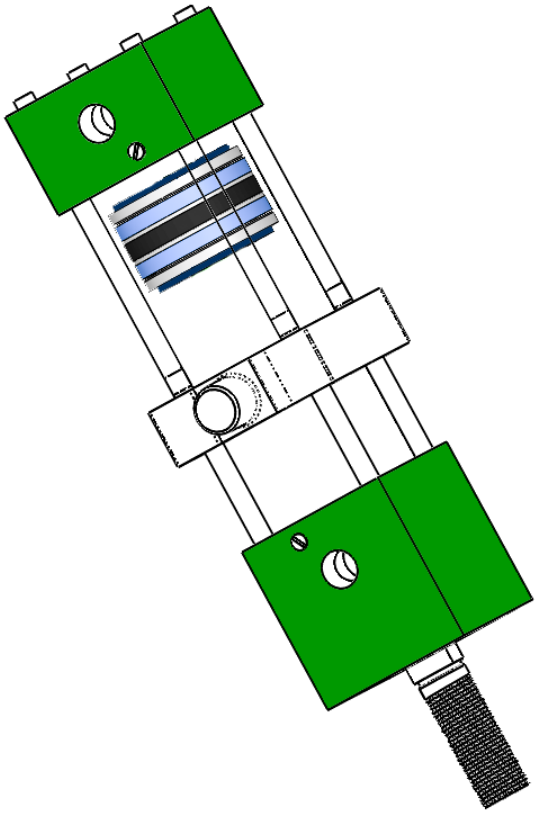
IMPROVED UPTIME
Challenge Trunnion pins break due to high shock loads.
Innovation Moved trunnion and machined out of alloy steel.
Benefit Longer pin life and less expensive to repair.

IMPROVED CUSHIONING
Challenge Dual Piston design results in impact during positioning causing piston and machine damage.
Innovation Cushioning system between pistons, reduces impact.
Benefit Significant reduction in impact between pistons result in greatly reduced piston and machine damage.

INCREASED LIFE
Challenge Gland bushing wears out prematurely due to constant short stroke movement with low lubrication.
Innovation Direct lubrication gland bushing with high load wear bands.
Benefit Increased gland, piston rod, rod seal and piston seal life with less air consumption.

WOOD INDUSTRY

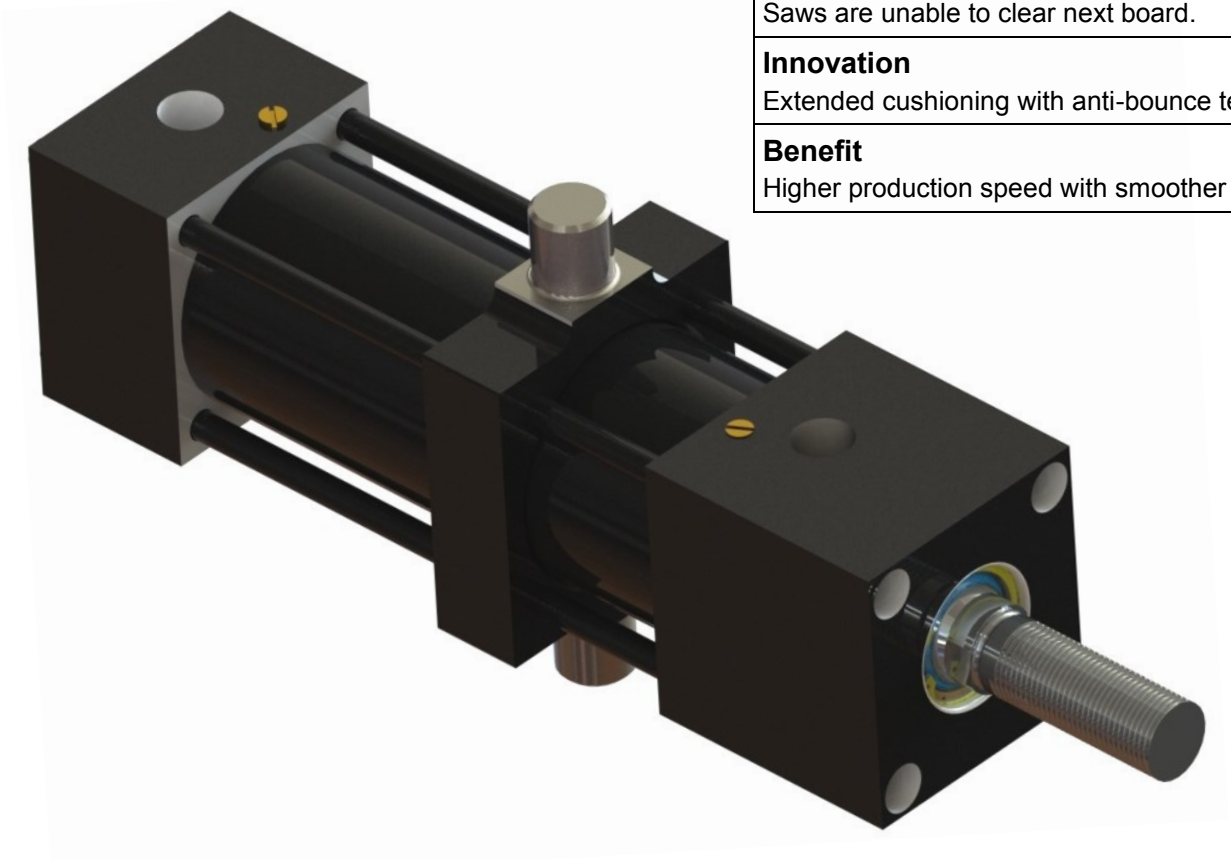
High Speed Trim Saw Cylinder



High Speed Trim Saw Cylinder

Runs Longer and Faster to Increase Board Feet Production

Royal trim saw cylinders last longer and cushion better than any other on the market. The all-steel housing makes it suitable for this harsh application. Extensive field testing and working with end users has advanced this model to the present format providing less downtime and faster response.



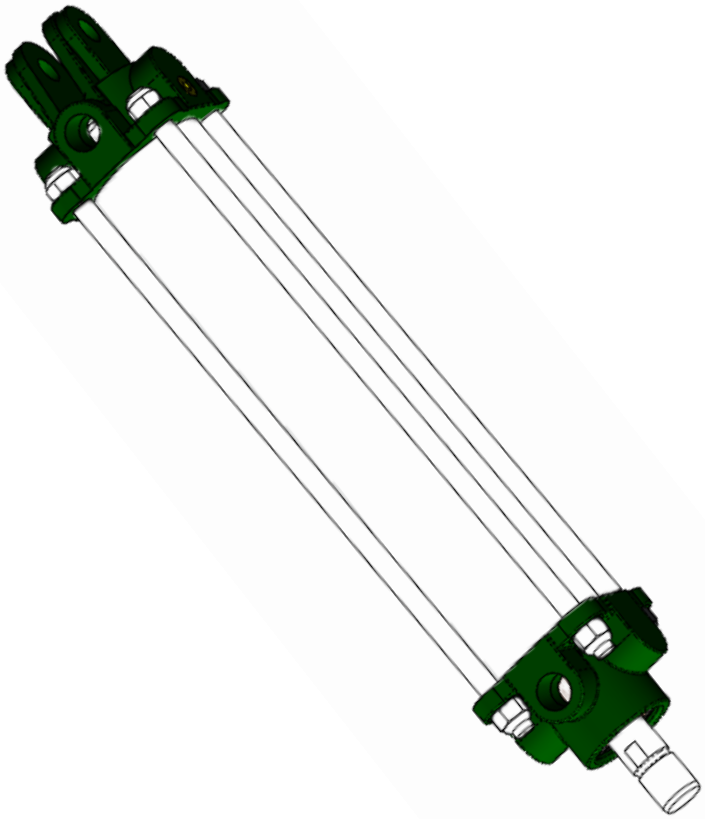
BETTER CUSHION ADJUSTABILITY
Challenge Retract speed too slow due to cushion bounce. Saws are unable to clear next board.
Innovation Extended cushioning with anti-bounce technology.
Benefit Higher production speed with smoother operation.

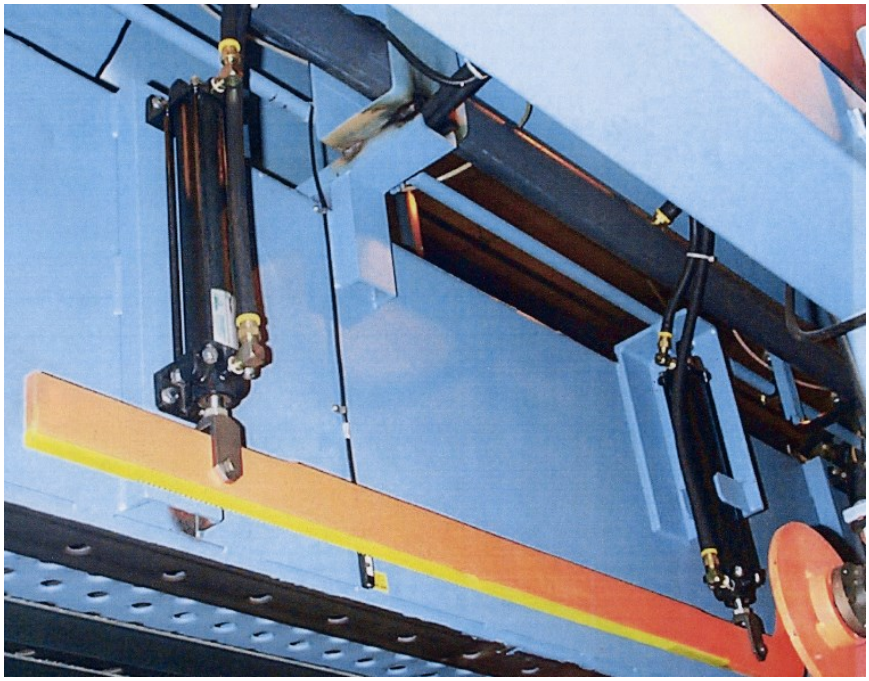
FASTER WITH MORE CONTROL
Challenge Controlled movement and fast speed.
Innovation Light weight piston with wear strips combined with nitrided steel barrel and piston rod.
Benefit Runs faster, smoother and is easier to cushion.

ROBUST CONSTRUCTION
Challenge Cylinder mounting and wear components unable to survive in environment.
Innovation All steel housing construction.
Benefit Able to rebuild cylinder back to OEM specifications multiple times, resulting in significant savings over the life of the cylinder.

WOOD INDUSTRY

Veneer Knock-Off Cylinders





Veneer Knock-Off Cylinders

Increase production quality, Faster and Quieter

We offer the fastest and most durable veneer stacking cylinder in the market. Upgrading your stacker with these cylinders will improve production speed, reduce sheet damage and reduce downtime.

REDUCED DOWNTIME
Challenge Cylinders hammering hard at end of stroke leading to cylinder and machine damage.
Innovation Custom cushioning and high shock absorbing features.
Benefit Reduced downtime and machine wear, lowering the total cost of ownership.

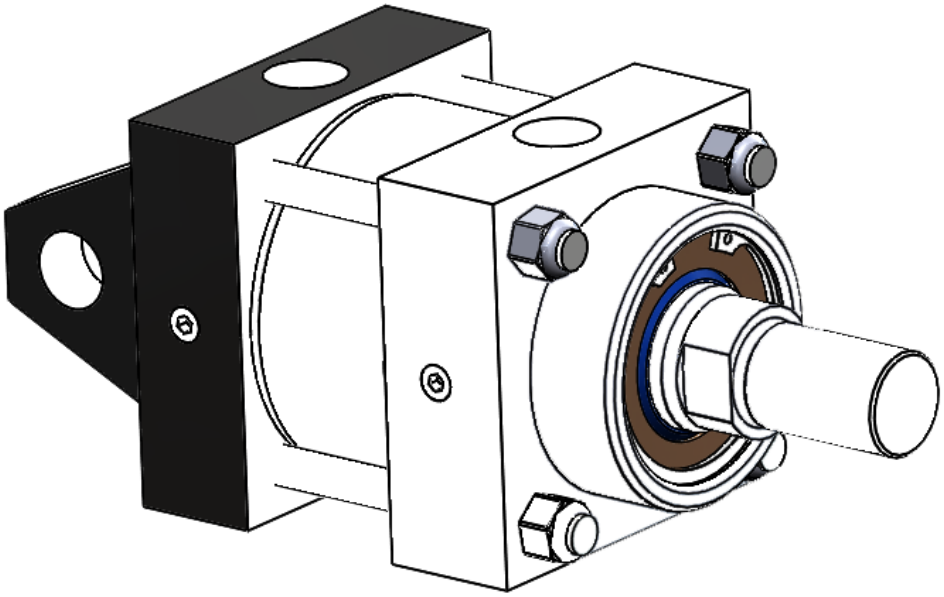
CONSISTENT RESPONSE TIME
Challenge Slow/variable extend/retract response times delay production and cause sheet damage.
Innovation Reduced breakaway pressure and running friction.
Benefit Faster more consistent breakaway gives better load quality with reduced sheet damage. Increased throughput from stable response times.

LONGER LIFE
Challenge Rod corrosion due to poor system air quality and lack of lubrication.
Innovation Nitrided steel rod and barrel with high slip seals.
Benefit Longer seal and component life. Longer time between rebuilds.

STEEL AND FABRICATING INDUSTRY

STEEL AND FABRICATING INDUSTRY

Non Lubricated Pneumatic Cylinders



Non Lubricated Pneumatic Cylinders

Reliable and Long Lasting Non Lubricated Cylinder

For most pneumatic applications, lubricated air is supplied to the cylinders. For applications that require zero air lubrication due to fire or contamination risk, Royal developed a pre-lubed cylinder that would retain its lubrication throughout its operating life.

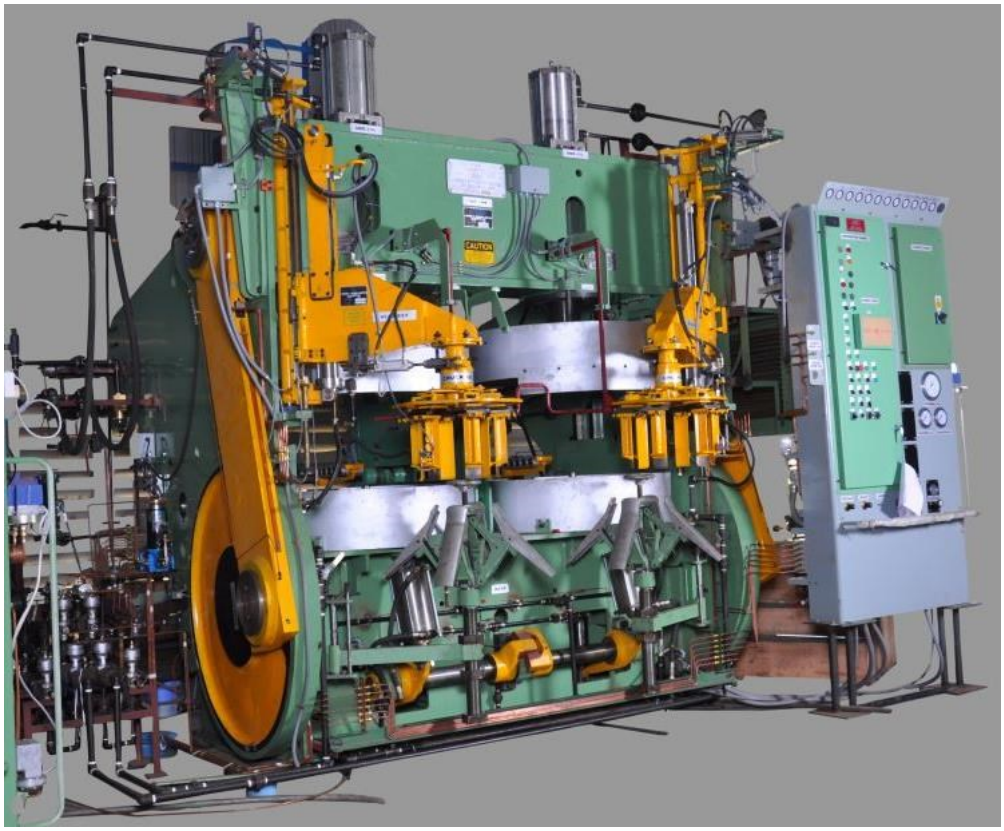
LONGER LIFE
Challenge Severe rod corrosion and scoring due to poor system air quality and lack of lubrication.
Innovation Nitrided steel rod and barrel with high slip seals and long life lubrication.
Benefit Longer seal and component life.

CONSISTENT RESPONSE TIME
Challenge Slow/variable extend/retract response times due to high friction.
Innovation PTFE based pre-lubrication was installed at assembly with seals and wear strips designed for lube retention.
Benefit Lubrication contained within the cylinder provides consistent breakaway times and velocity.

TIRE MANUFACTURING

TIRE MANUFACTURING

Water Operating Tire Press

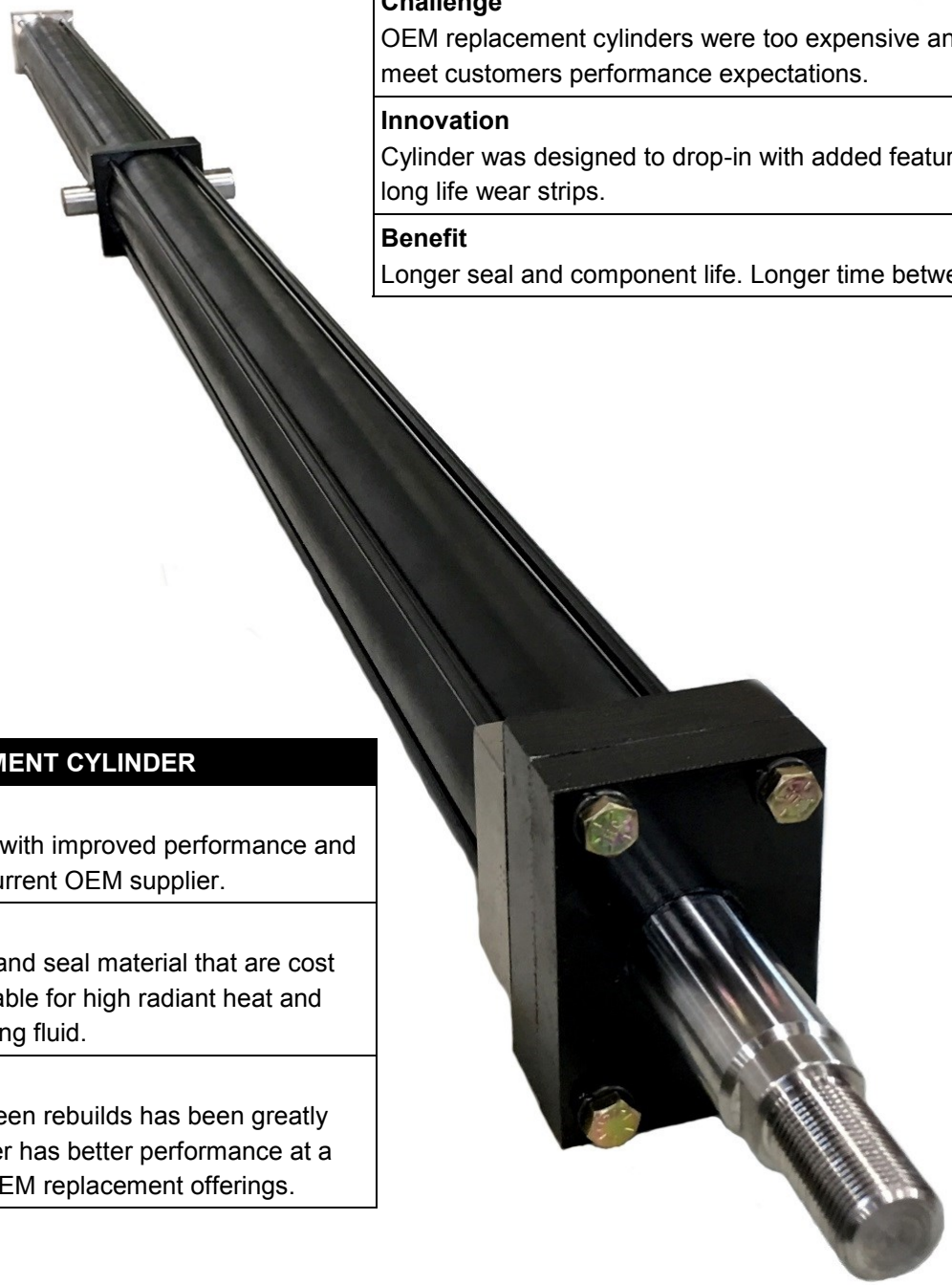


Water Operating Tire Press

Cost Effective High Performance OEM Replacements

Cylinders using water as a working fluid have their own unique challenges. They often operate in harsh conditions caused by contaminated water, risk corrosion due to water quality and conductivity, and face poor lubrication and concentrations of oxygen in the water.

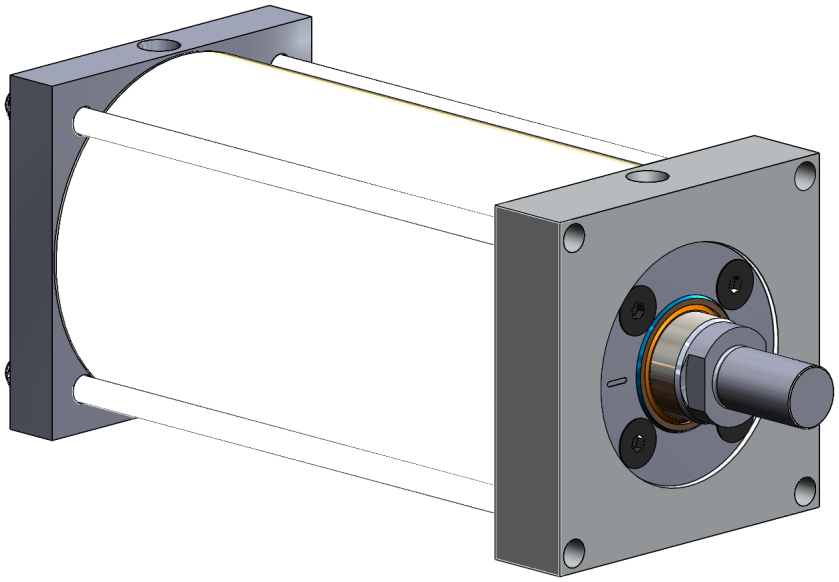
DROP IN REPLACEMENT
Challenge OEM replacement cylinders were too expensive and did not meet customers performance expectations.
Innovation Cylinder was designed to drop-in with added features such as long life wear strips.
Benefit Longer seal and component life. Longer time between rebuilds.

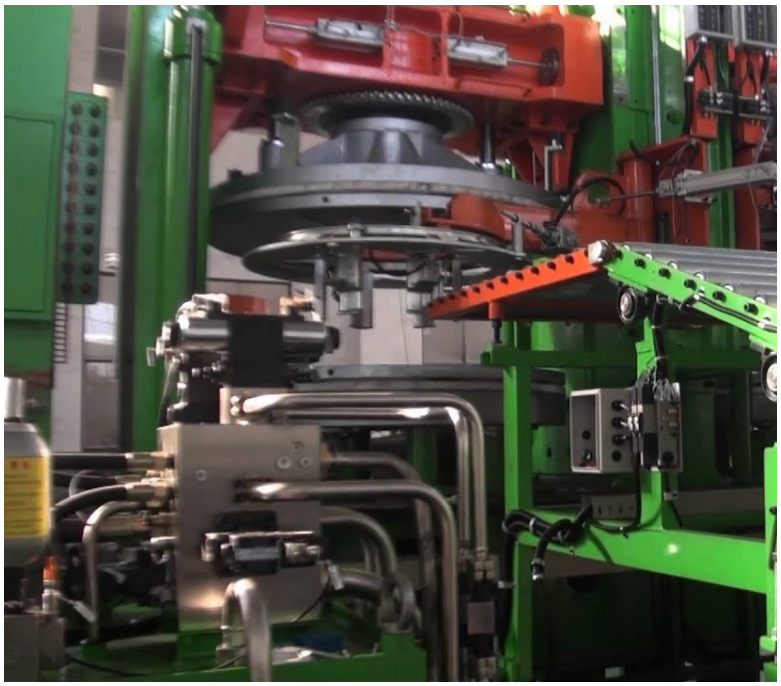


OEM REPLACEMENT CYLINDER
Challenge Create a cylinder with improved performance and lower cost than current OEM supplier.
Innovation Select barrel rod and seal material that are cost effective and suitable for high radiant heat and poor quality working fluid.
Benefit Cylinder life between rebuilds has been greatly extended. Cylinder has better performance at a lower cost than OEM replacement offerings.

TIRE MANUFACTURING

Water Service Cylinder in Tire Press





Water Service Cylinder in Tire Press

Robust and Innovative for long life in harsh environments

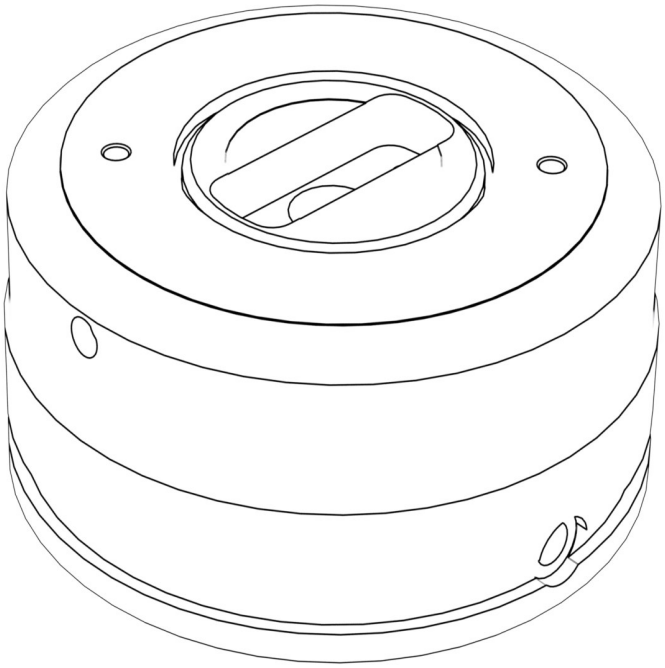
Cylinders using water as a working fluid have their own unique challenges. They often operate in harsh conditions caused by contaminated water, risk corrosion due to water quality and conductivity, and face poor lubrication and concentrations of oxygen in the water.

DROP-IN REPLACEMENT
Challenge OEM replacement cylinders were too expensive and did not meet customers performance expectations.
Innovation The cylinder was designed to drop-in with added features such as long life wear strips.
Benefit Longer life for seal and running components.

INCREASED CORROSION RESISTANCE
Challenge Finding materials that won't corrode or pit when exposed to poor water quality.
Innovation Using a combination of brass and stainless steel, a cost effective solution was implemented significantly increasing service life.
Benefit This greatly improved the life and total cost of ownership of the cylinder running in these adverse conditions.

TIRE MANUFACTURING

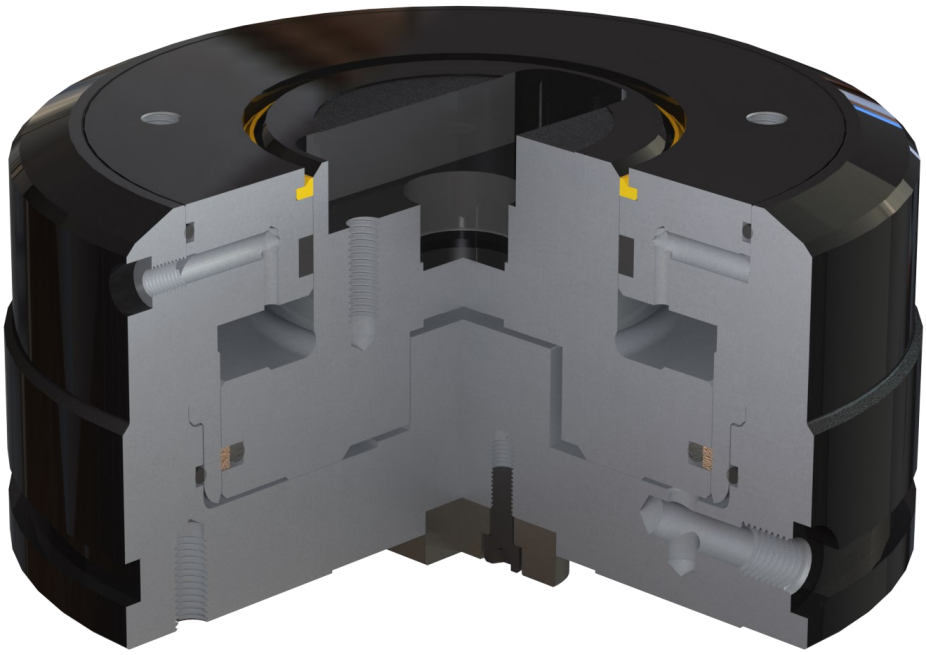
Hydraulic Pancake Cylinder for Tire Press



Hydraulic Pancake Cylinder for Tire Press

Durable and Cost Effective OEM Replacement

This cylinder was developed to meet the needs of the tire press industry. The existing OEM cylinder was wearing out prematurely and incurring high production failure costs due its inability to maintain required mold locking pressures.



IMPROVED WEAR SURFACES
Challenge Improve the quality and durability of wear surfaces to improve seal life and prevent material surface failure.
Innovation Nitride surface hardening to key surfaces that are under extreme loads.
Benefit Cylinder body and piston/rod components will not deteriorate from high force contact.

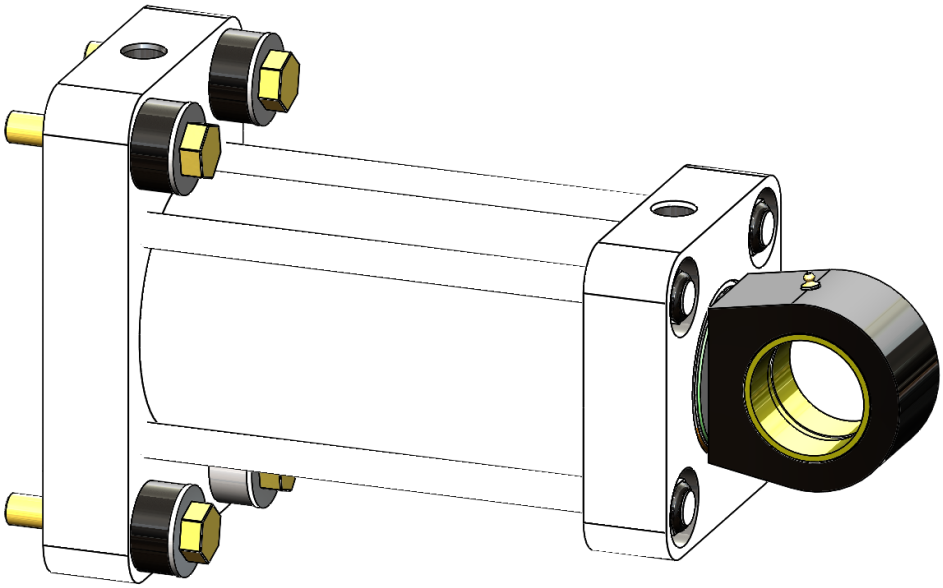
DROP IN REPLACEMENT
Challenge OEM replacement cylinders were too expensive and did not meet customers performance expectations.
Innovation The cylinder was designed to drop-in with added features such as long life wear strips.
Benefit Longer seal and component life. Longer time between rebuilds.

REDUCED DOWNTIME
Challenge Existing seals were failing from misalignment and poor quality.
Innovation Seals were redesigned along with wear strips being introduced to improve side load resistance.
Benefit This greatly improved the life and total cost of ownership of the cylinder running under adverse conditions.

MISCELLANEOUS CYLINDERS

RAIL INDUSTRY

Hydraulic Cylinder for Rail Car Wheel Gripper



Hydraulic Cylinder for Rail Car Wheel Gripper

Extreme Load with Engineered Wear Surfaces

This cylinder was developed to improve the bulk handling of rail cars. Rail car wheel grippers often get damaged due to control errors where the rail car is moved before the safety wheel gripper has been released. This results in damage to the operating mechanism. The bulk material is often abrasive which wears out linkages prematurely.

DROP-IN REPLACEMENT
Challenge OEM replacement cylinders were too expensive and did not meet customers performance expectations.
Innovation Cylinders were design to drop in with added features such as long life wear strips.
Benefit No machine modifications. Longer time between repairs.

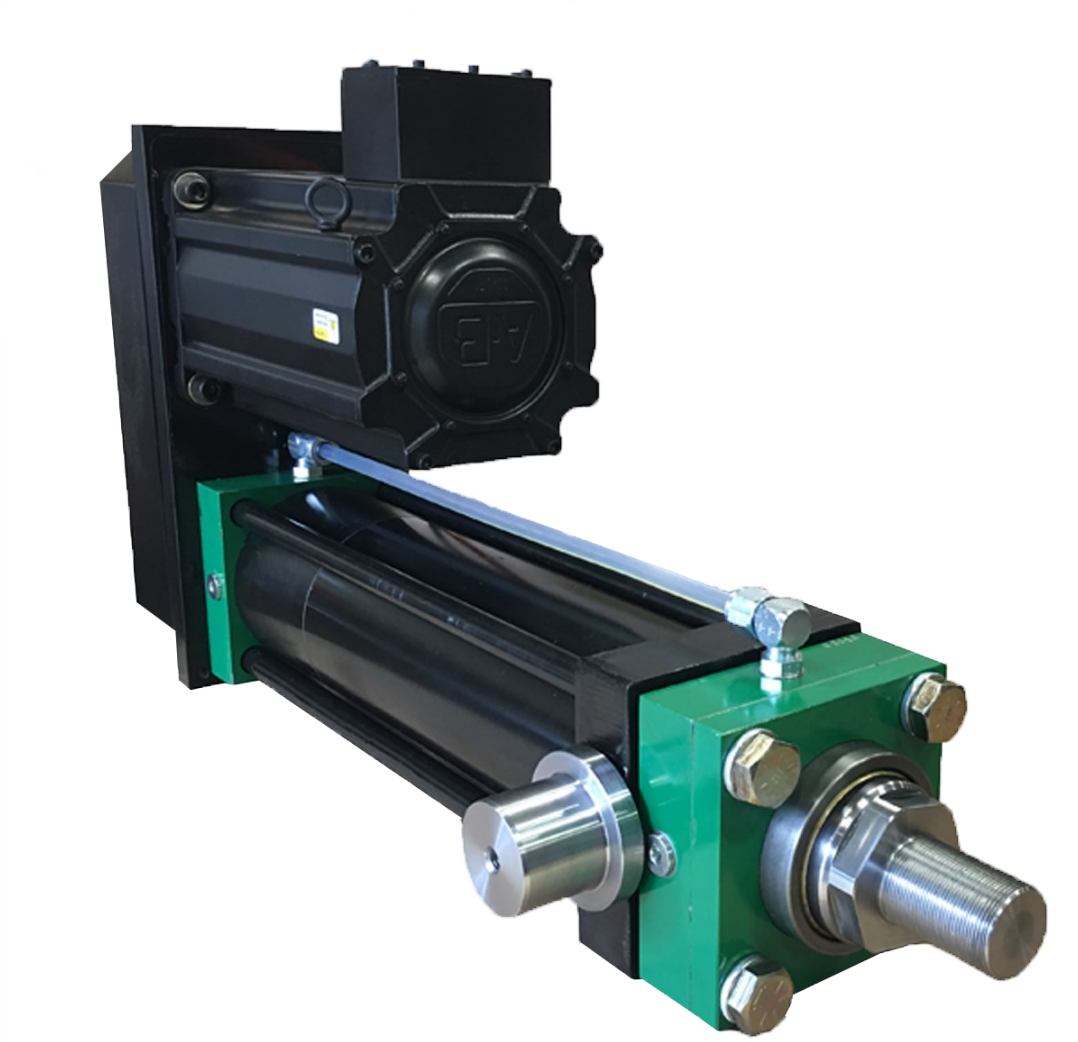
Rail Car Wheel Grip-

IMPROVED WEAR SURFACES
Challenge Improve the longevity of the key wear surfaces in hostile environments.
Innovation Nitride surface hardening to surfaces that are under extreme loading.
Benefit Cylinder body and piston/rod components will not deteriorate from high force contact.

REDUCED DOWNTIME
Challenge Rod clevis was wearing prematurely and clevis end was breaking due to misalignment.
Innovation Compliant bushing was installed in clevis to absorb grit from operating environment. Compliant bushing allowed for other components to wear without causing catastrophic damage to clevis.
Benefit This greatly improved cylinder life at a lower price.

ELECTRIC ACTUATOR

E-Series Roller Screw Cylinder



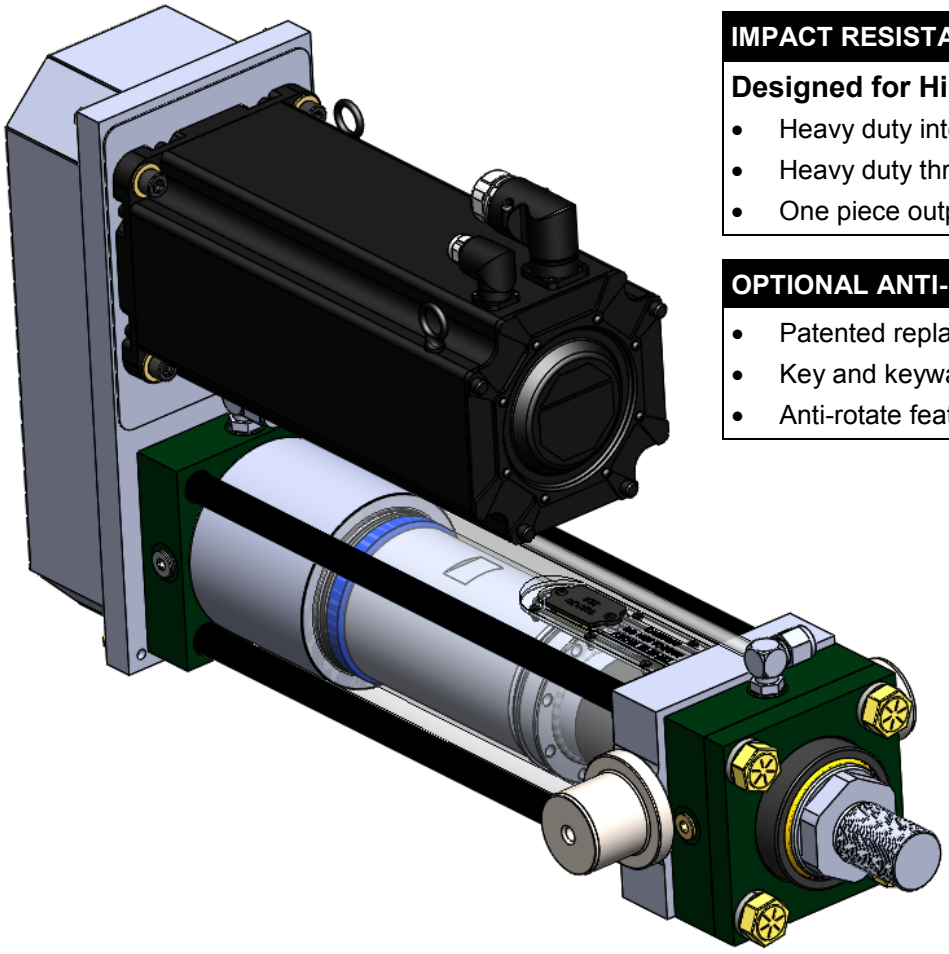
Why Choose a Royal Electric Actuator

- Specifically designed for the harsh wood processing environment
- Based on our high pressure hydraulic cylinder line
- All steel construction
- Proven track record

E-Series Roller Screw Cylinder

Strongest Electric Cylinder in the World

Royal E Series electric cylinders are designed specifically for the demands of the lumber processing industry. Designed for the harshest environments and proven to be the longest lasting industrial electric cylinder on the market.



IMPACT RESISTANCE

Designed for High Impact Forces

- Heavy duty internal bumpers
- Heavy duty thrust bearing
- One piece output tube

OPTIONAL ANTI-ROTATE

- Patented replaceable hardened keyway and key
- Key and keyway can be replaced in situ
- Anti-rotate feature can be disengaged

HEAVY DUTY CONSTRUCTION

SOLID One Piece Output Shaft
Strongest shaft on the market which is engineered to support the roller nut which helps to protect the screw against side loads.

Industrial Mounts

- One piece trunnion mounts with replaceable sleeves
- Front plate mounts oversized for maximum strength
- Custom mounts available

Steel Housing Construction
Designed around our proven hydraulic cylinder line.

OPERATIONAL ADVANTAGES

Durable Wipers and Scrapers
Heavy duty brass rod scrapers protect precision components from harsh environmental contaminants.

Dual Gland Bushing Wear Strips
Easily replaceable, high load wear strips eliminate gland bushing wear.

Nitrided Piston Rods
High corrosion resistant steel material has superior wear and impact resistance, resulting in increased seal life.

BUILT TOUGH. BUILT TO LAST.

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