



The Leader in Actuator Technology



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QTRCO - Pneumatic Actuators

AGENDA:

- Actuator company that has dared to be different
- A differentiated product that offers exceptional value
- Proven Results - Application Success



Evolution of Technology...

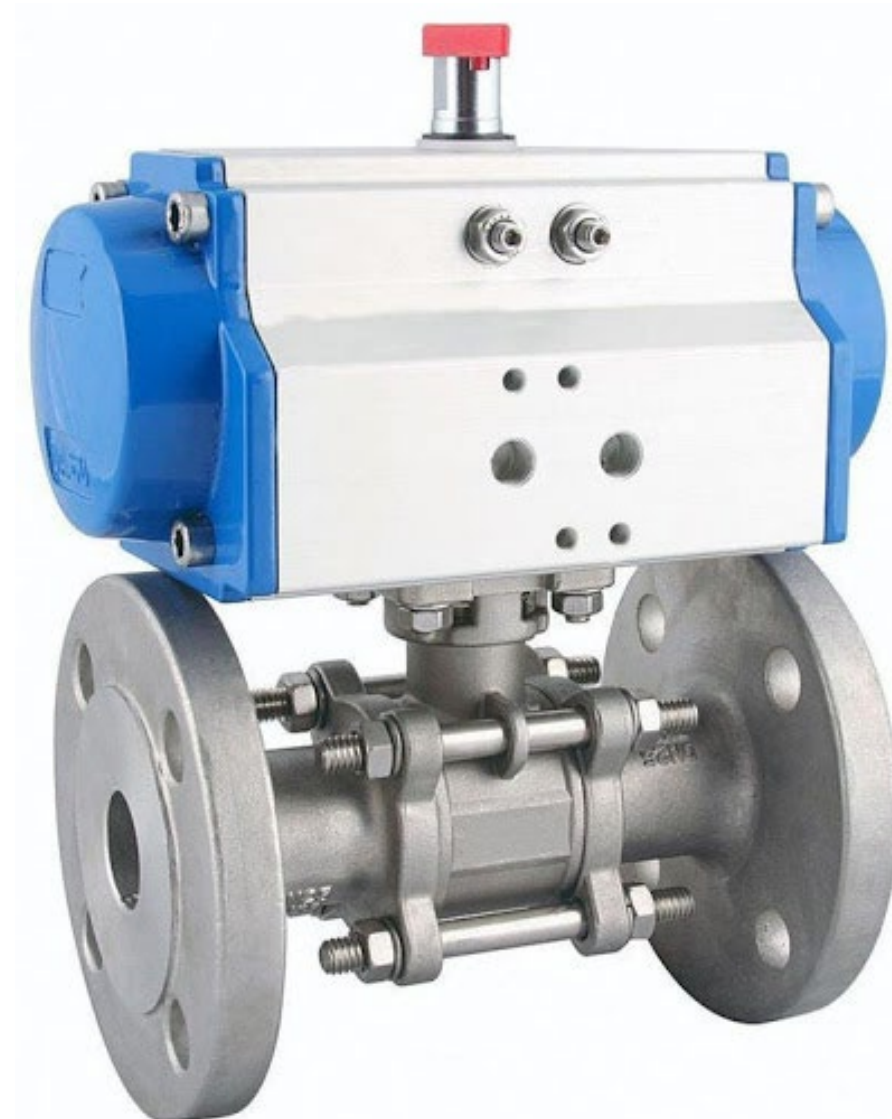


Many products have radically advanced in the last 30-40 yrs

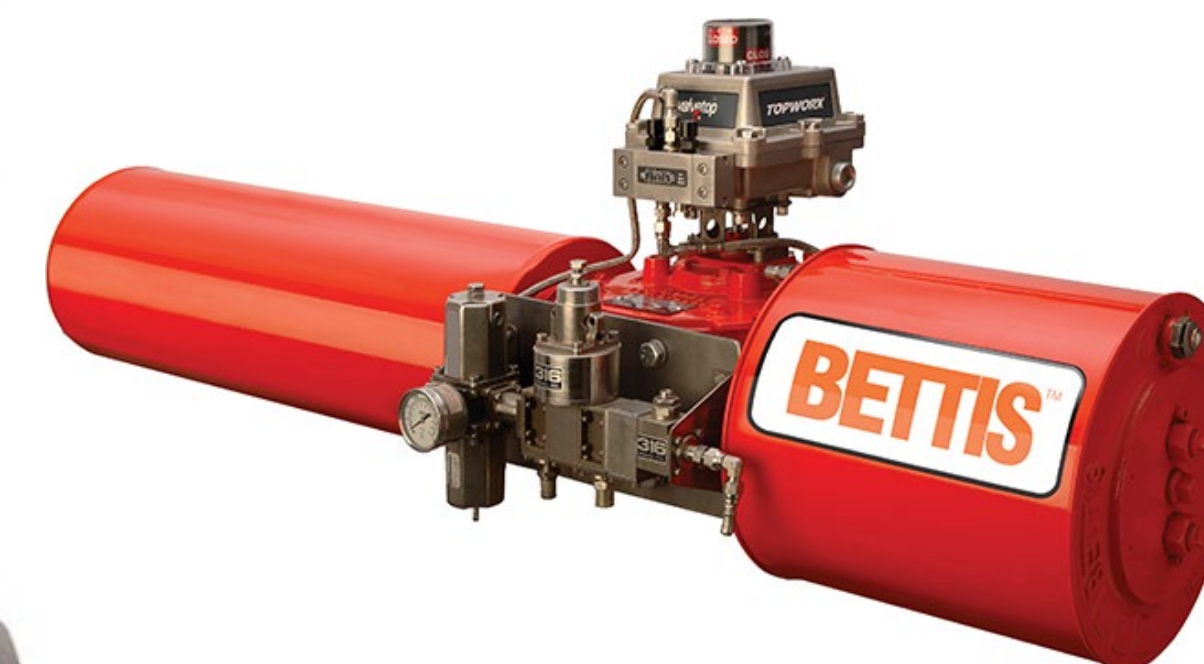
Phones, Cars, Computers
What about pneumatic actuators?



Evolution of **Actuator** Technology...



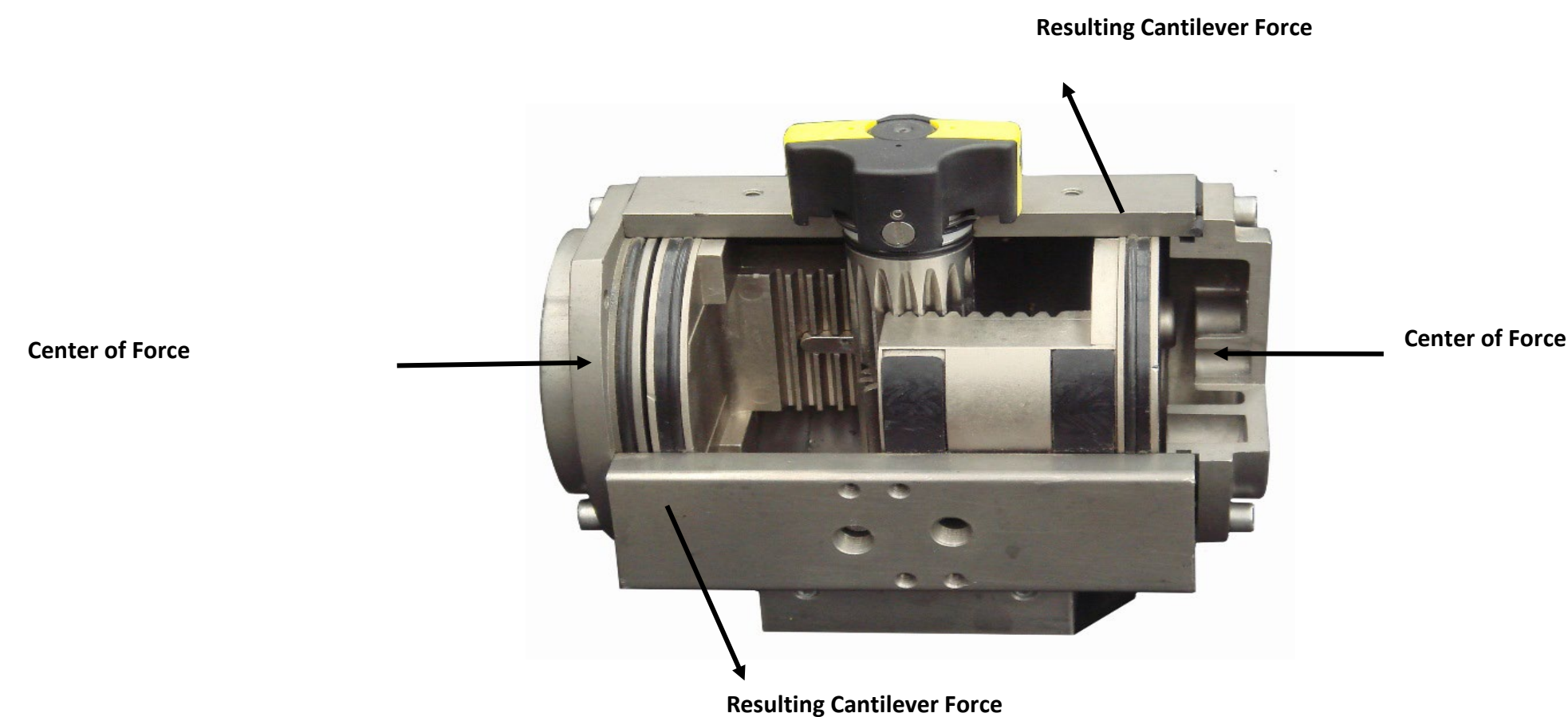
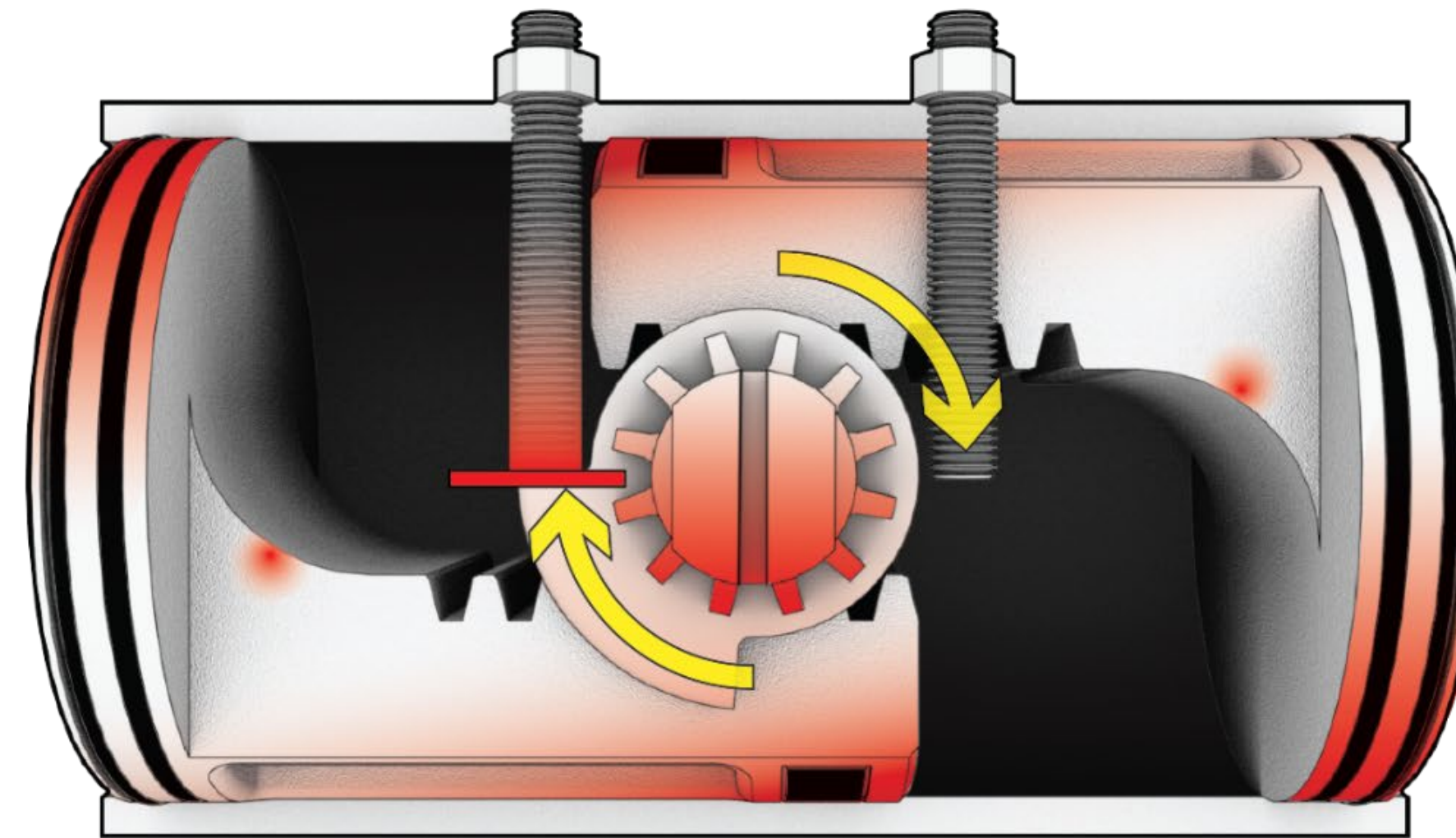
Rack & Pinion Actuators



Scotch Yoke Actuators

Traditional Rack & Pinion Actuators

- Rack gear is off center with the piston causing a cantilever force, forcing the piston against the cylinder wall creating friction and wear
- Sliding friction occurs between piston and cylinder wall. Rack & Pinion designs locate polymeric bushings to reduce wear.
- Pressure must be applied to body center which constantly pressurizes shaft seals resulting in performance degradation over time
- A small amount of shaft corrosion at shaft seal allows for bushing failure and binding
- Internal travel stops apply significant side loading to actuator shaft stressing internal components



Traditional Rack & Pinion Actuators

Zero Thrust Forces

Traditional Rack & Pinion Shaft

- Seal between shaft & body
- Shaft contacts body
- Pistoning force

	Metric	Imperial
Area Delta	967 mm ²	1.5 in ²
Supply Pressure	5.5 Bar	80 psig
Downward Force	534 N	120 lb-f
Load on Retaining Ring	5.1 N/mm ²	740 psi

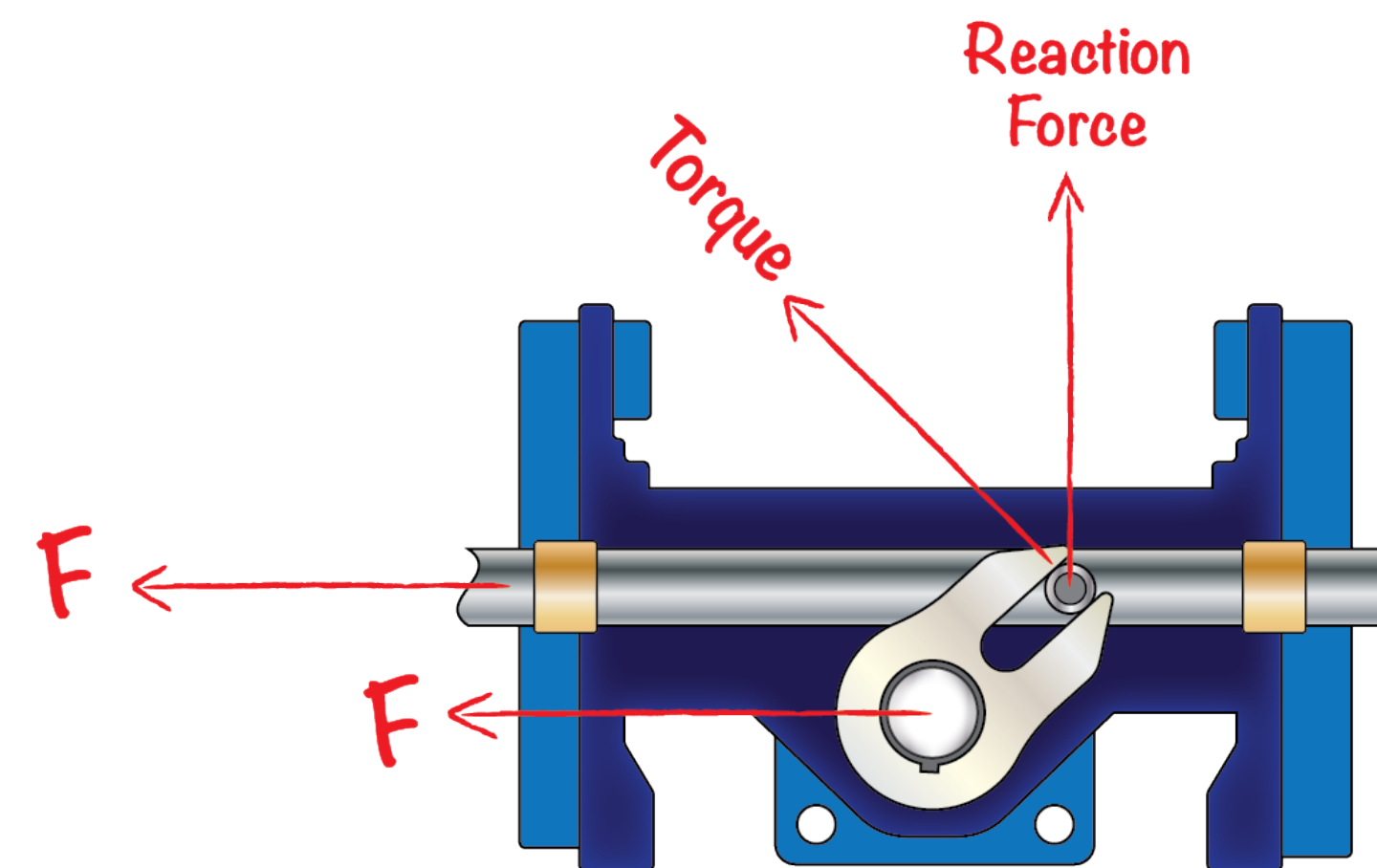
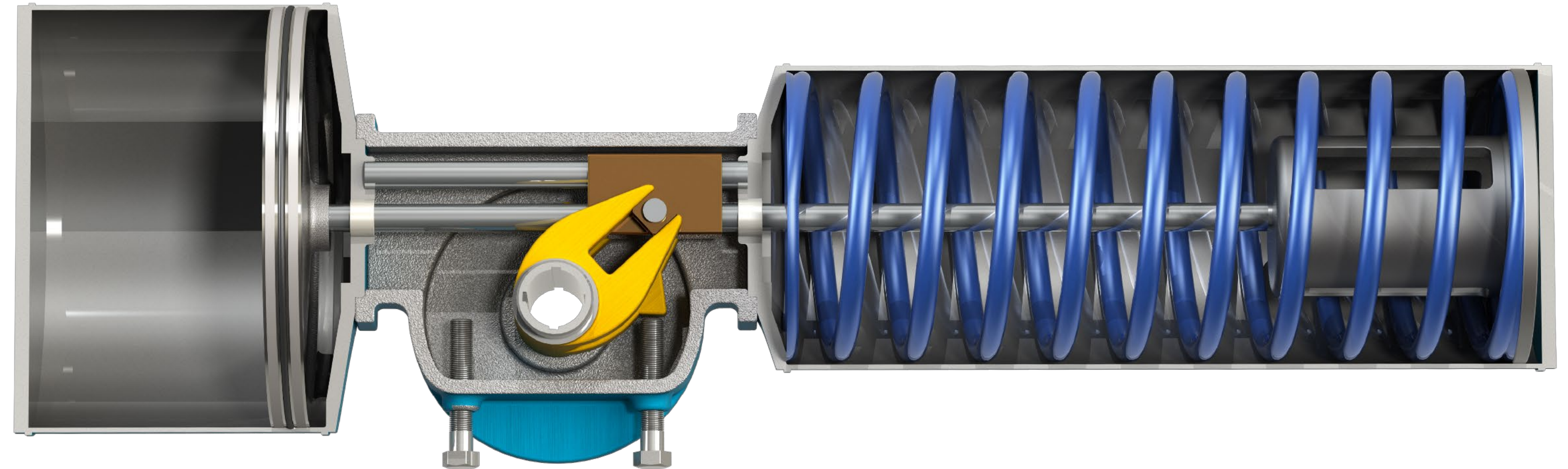


Q Series Shaft

- Pressure Balanced
- Double Square Drive
- Both Ends identical

Traditional Scotch Yoke Actuators

- The force applied to the piston rod is also applied to the shaft and shaft bushings resulting in friction and bushing wear
- Sliding friction occurs between piston rod and yoke and typically a slide in the yoke slot
- Torque due to the angular rod contact with the yoke arm increases with effectively longer arm length and the angle of arm rotation – however the reaction force tending to bend the piston rod increases as well.
- Proprietary rod and piston seals are required as pistons are forced outward by applied pressure to compress the spring



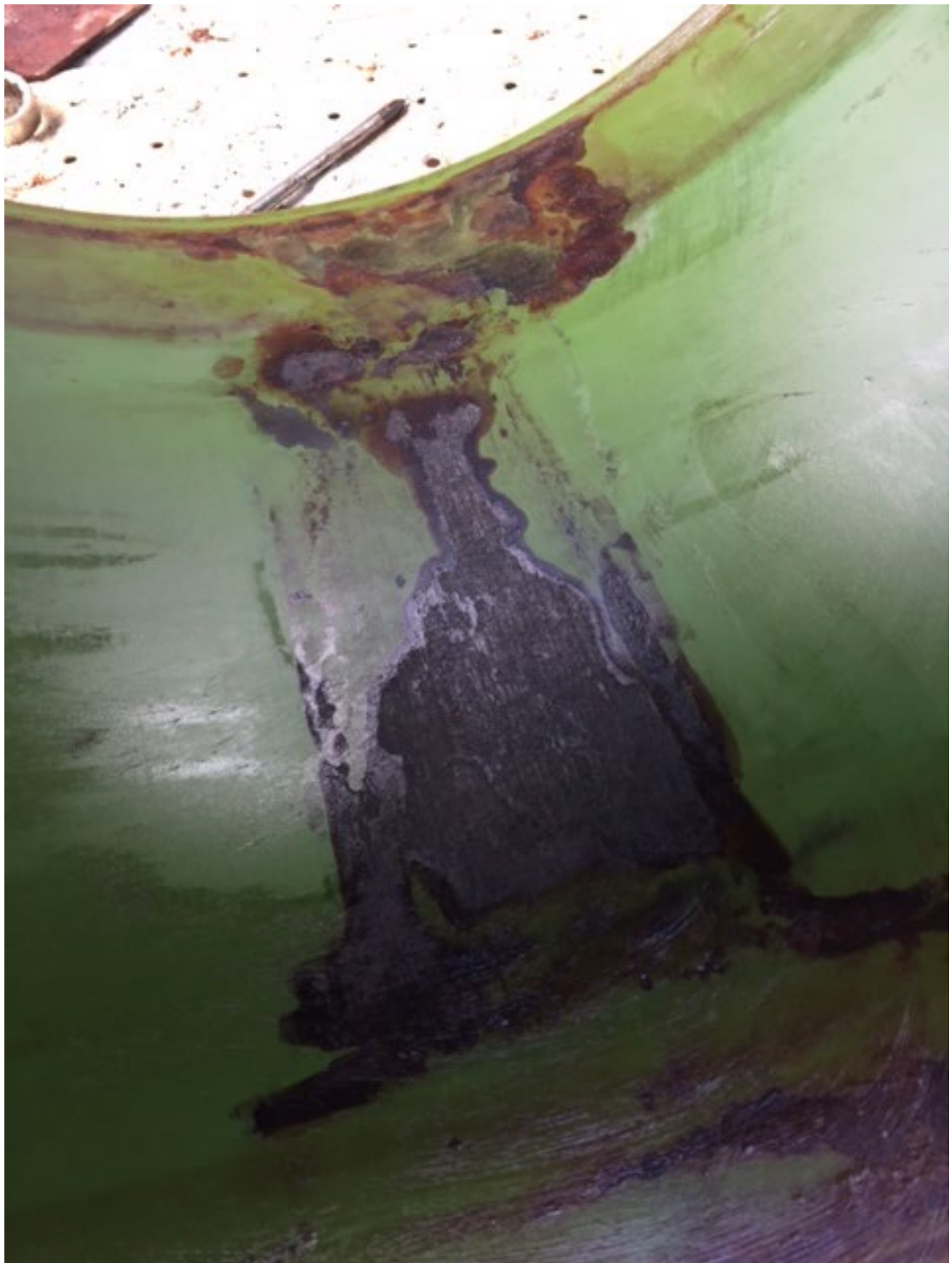
Traditional Scotch Yoke Actuators



**Support Rod
Corrosion**



Yoke corrosion



Cylinder wear

Traditional Scotch Yoke Actuators





Differentiate: Pneumatic Actuators

We did not set out to mimic others or to design the cheapest possible actuator, rather our intent from day one was to provide solutions that improve basic actuator performance or handle extreme service applications.

Differentiate Pneumatic Actuators

Materials of Construction

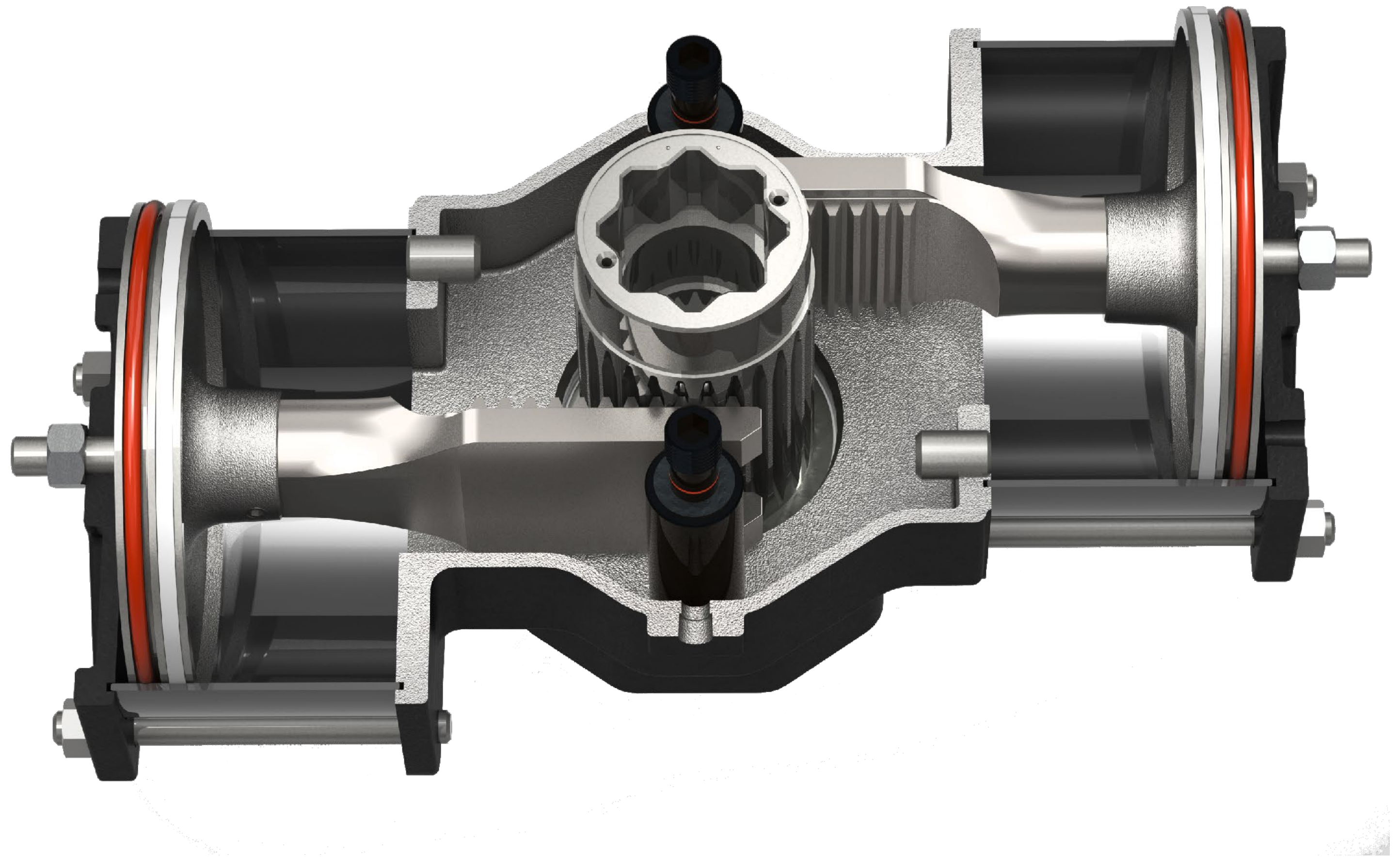
- QTRCO actuators are offered in all stainless steel and in ductile iron housings
- Stainless Steel, Aluminum, Amalgon or Carbon Steel Cylinders



Differentiate Pneumatic Actuators

Engineered Difference

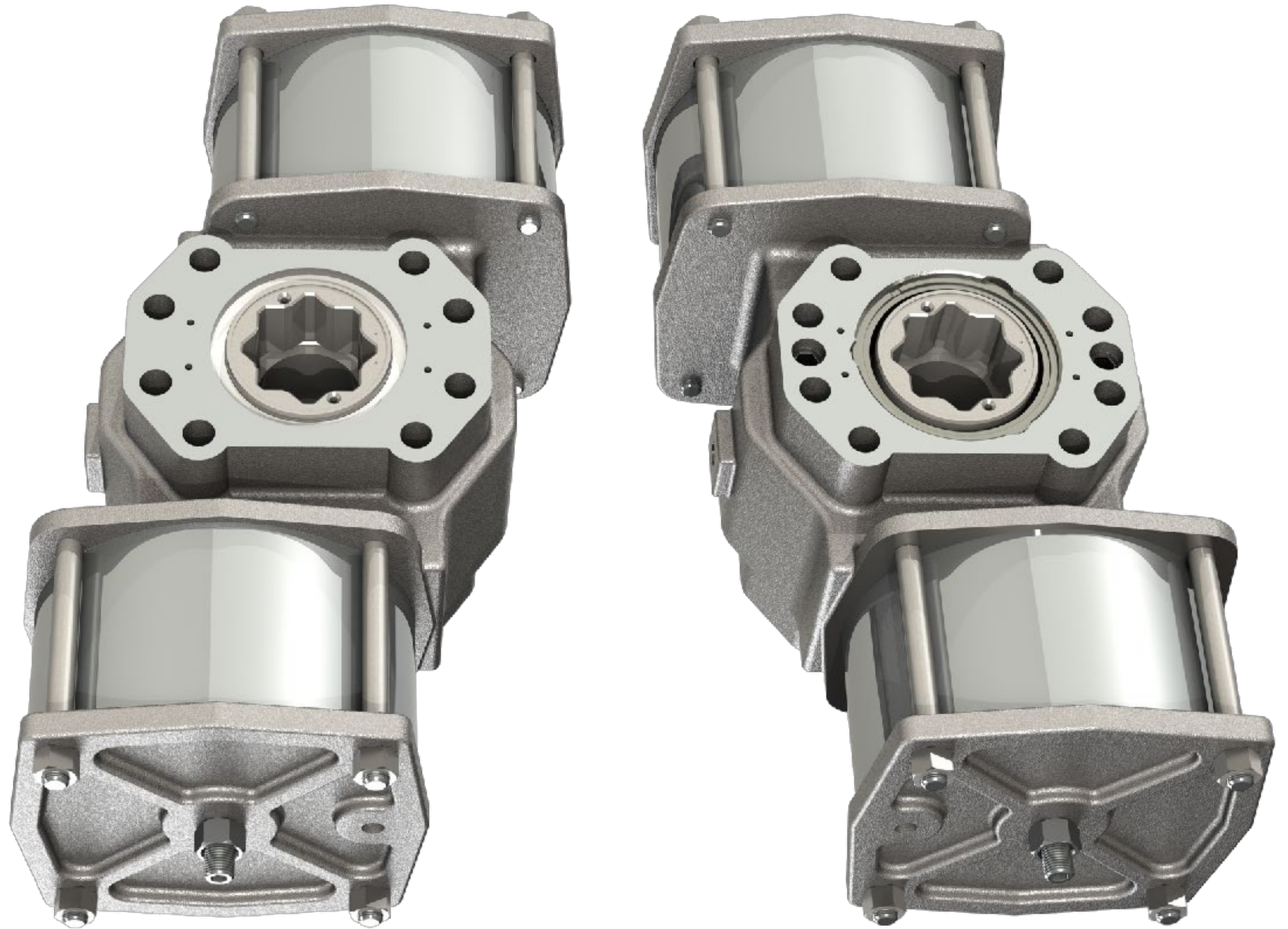
- Cylinders are offset to eliminate life shortening cantilever forces and friction.
- Low friction, roller supported rack and gears hold racks in place while extending life and enabling extreme operating speeds.
- Identical top and bottom mounting geometries
- Action reversal by simply turning the actuator topside down.



Differentiate Pneumatic Actuators

Engineered Difference

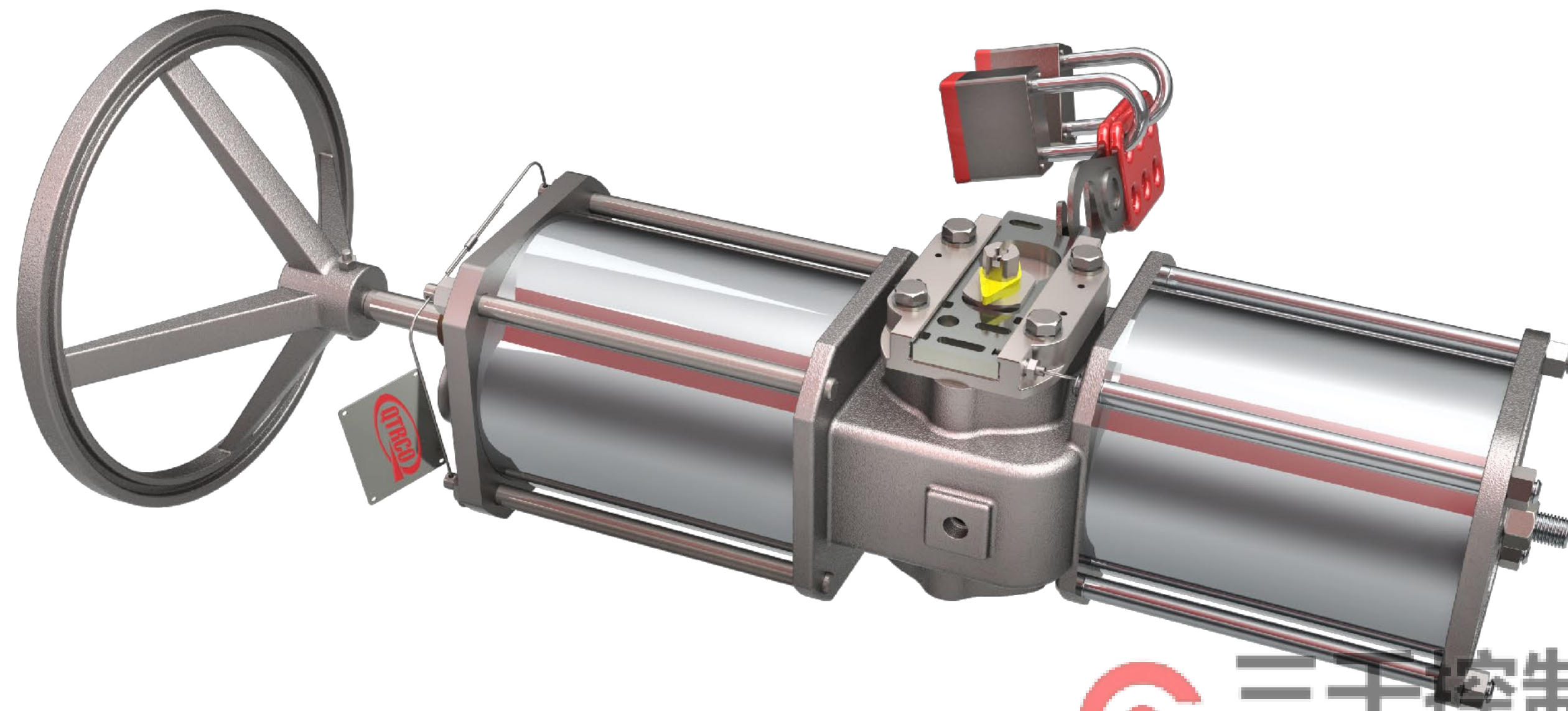
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Differentiate Pneumatic Actuators

Inherent Safety Features

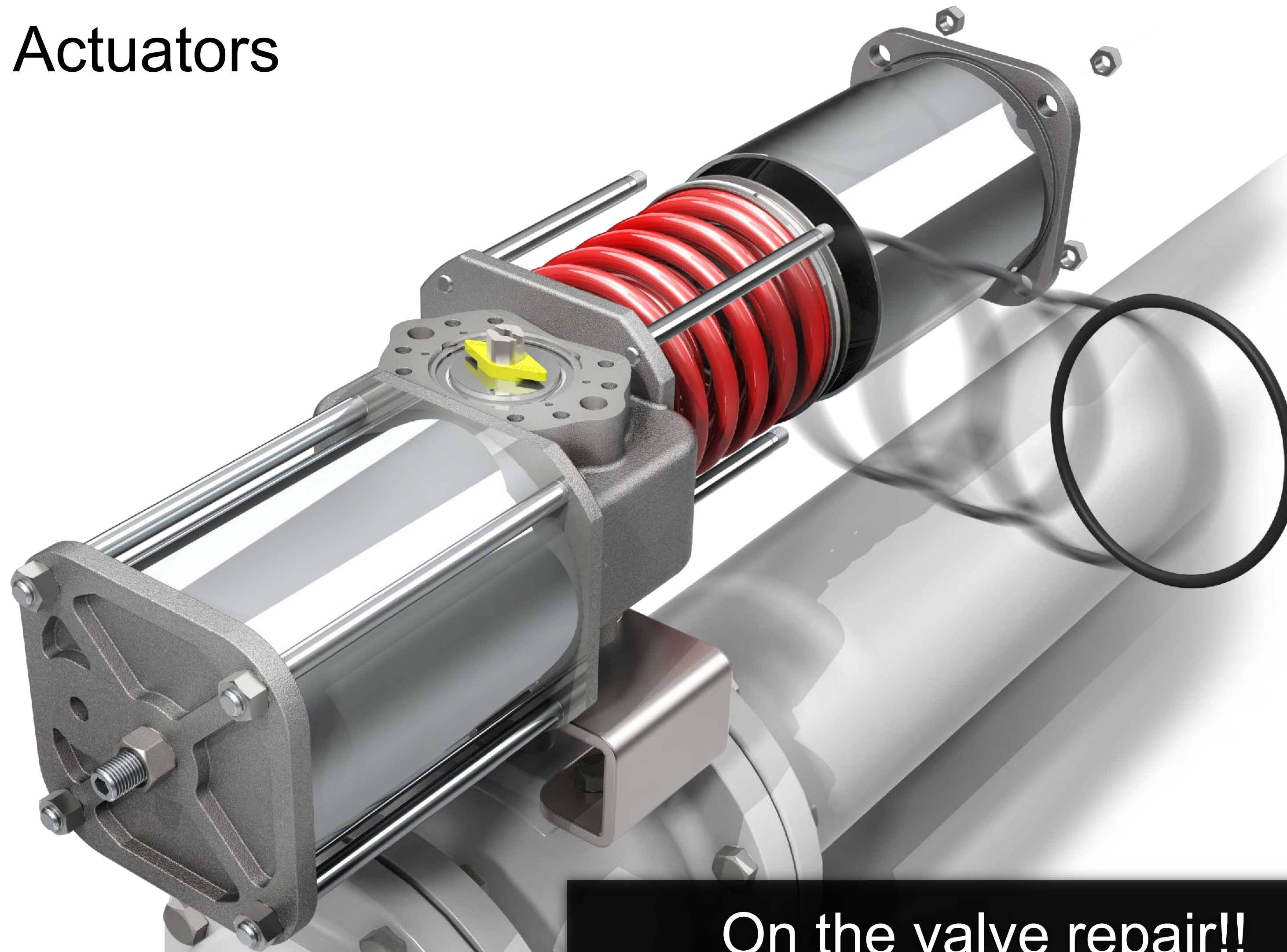
- Fully captured springs
- Built-in lock outs, manual jack screw or hydraulic overrides,
- Safe in-situ replacement of contaminant damaged seals



Differentiate Pneumatic Actuators

Inherent Safety Features

- Fully captured springs
- Built-in lock outs, manual jack screw or hydraulic overrides,
- Safe in-situ replacement of contaminant damaged seals



On the valve repair!!
significant reduction in repair time



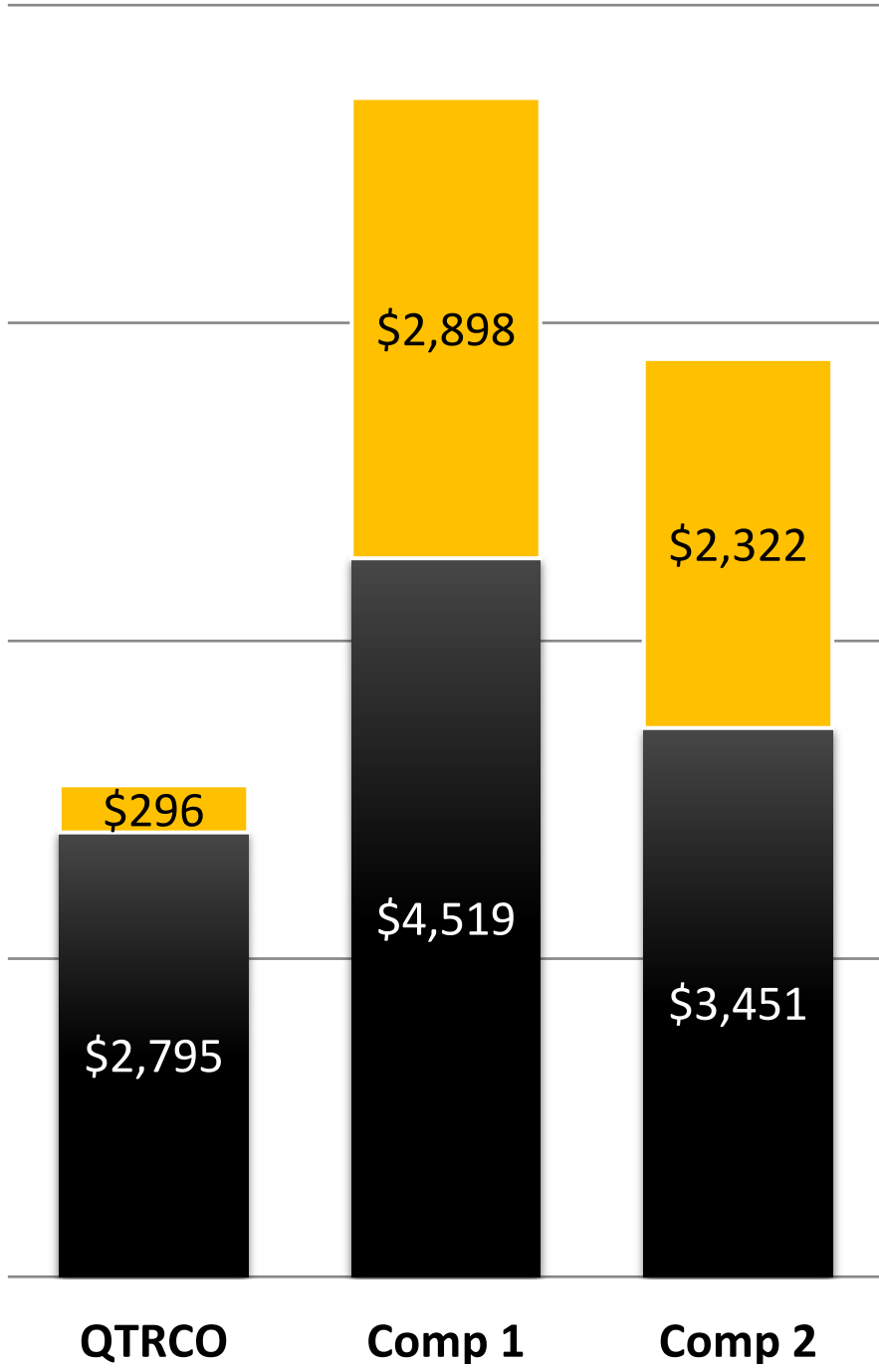
Performance **Warranty:**

QTRCO will during the period of 3 years from the date of original invoice, repair or replace (at QTRCO's sole option) any QTRCO actuator that fails in service regardless of the number of cycles, provided always that the actuator was installed correctly, properly maintained/serviced and applied as per the original user application specifications. The actuator must be returned to QTRCO within the 3 year warranty period at the sender's cost. The warranty does not apply to any freight or other charges.

Differentiate Pneumatic Actuators

Total Cost of Ownership

	QTRCO F-Series		Competitor 1[SEP]XXXXXX-SR1		Competitor 2[SEP]XXXXX-S070	
Initial Purchase Price	\$2,795.00		\$4,519.00		\$3,451.00	
Seal Replacement Cost	Hours	Cost	Hours	Cost	Hours	Cost
Removal and Installation Cost	--	--	3	\$600	3	600
Crane Rigging	--	--	2	\$1000	2	\$1000
Repair Cost	2	\$200	4	\$400	3	\$300
Re-Calibration Cost	--	--	1	\$100	1	\$100
Replacement Seal Cost		\$96		\$798		\$322
TOTAL	2 hours -	\$296	10 hours -	\$2,898	9 hours -	\$2,322



Differentiate Pneumatic Actuators

Q Series

Rack & Gear®

Temperatures

from -76°F to +450°F (-60°C to +232°C)

90° Rotation

(±5° at each end of travel)

Double acting & Spring return

Torques to 21,000 in-lb (2,373 Nm)

Operating Pressure

Pressure to 175 psig (12 bar)

Construction:

Stainless Steel or Ductile Iron

Double acting & Spring return

Torques to 500,000 in-lb (56,492 Nm)

Operating Pressure

Pressure to 150 psig (10.3 bar)

Construction:

Stainless Steel or Ductile Iron

or Ductile Iron

L Series

Linear®

Temperatures

from -76°F to 500°F (-60°C to 260°C)

Stroke

up to 4" (102 mm) Extended stroke available

Double

(bar)

F Series

Flat Valve

Temperatures

from -76°F to +450°F (-60°C to +232°C)

90° Rotation

(±5° at each end of travel)



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Differentiate Pneumatic Actuators

Q Series Rack & Gear®

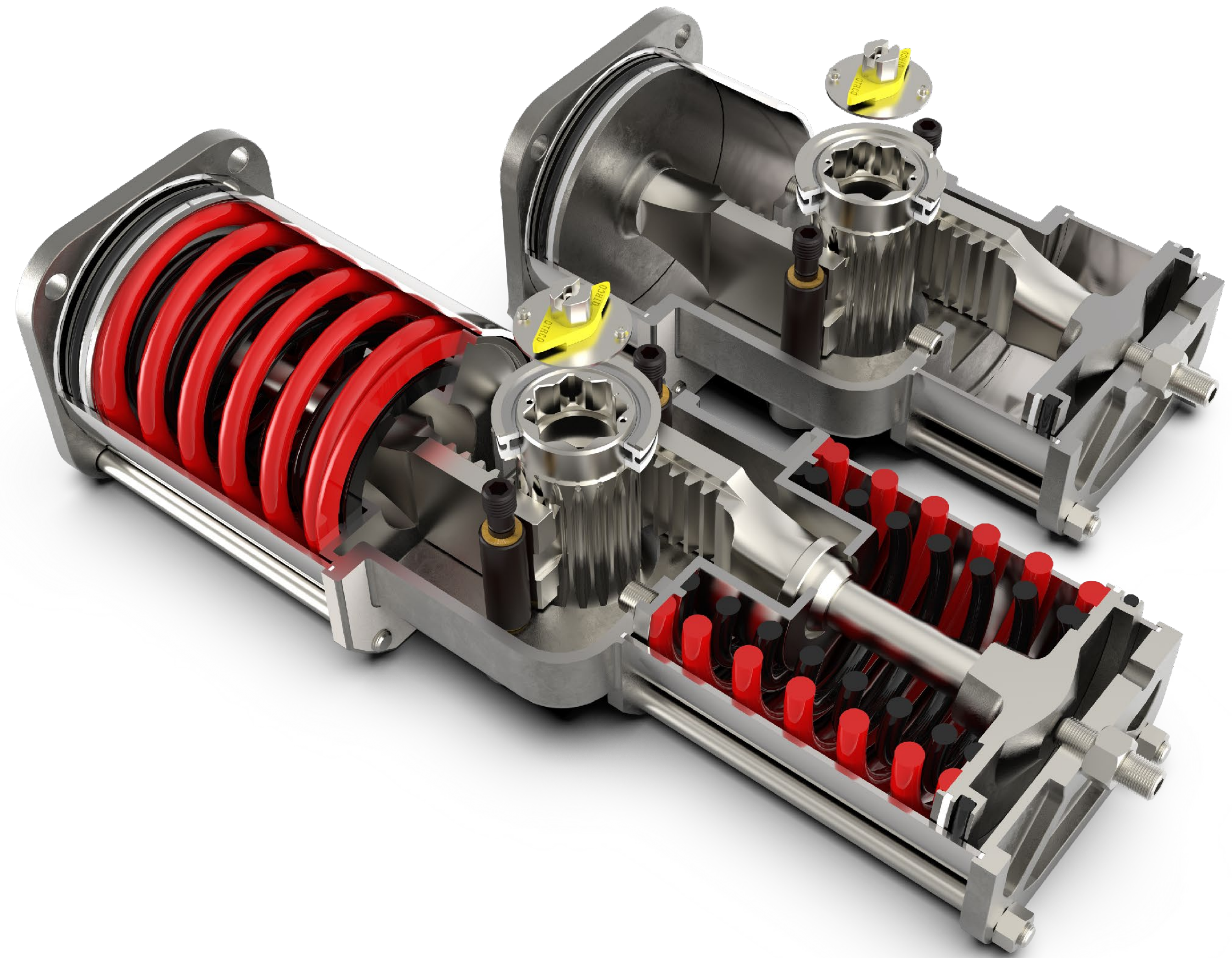
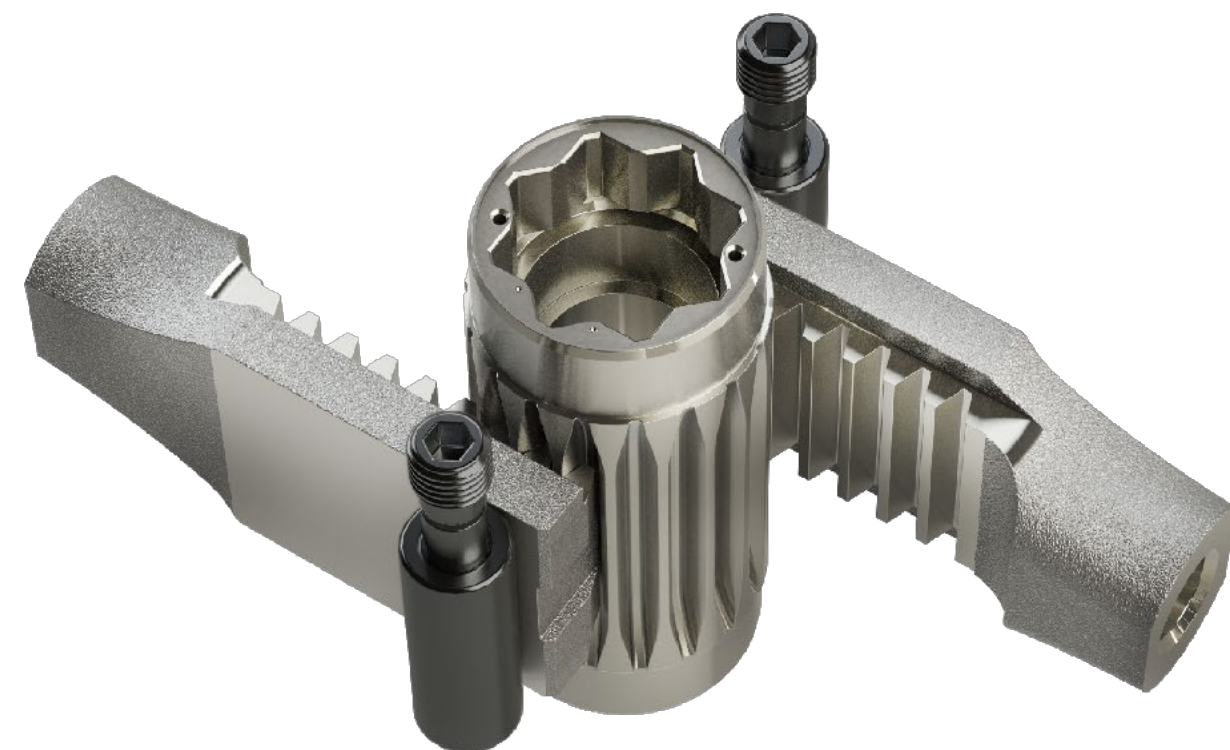
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Operating Pressure
Pressure to 175 psig (12 bar)

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Differentiate Pneumatic Actuators

Q Series Rack & Gear®

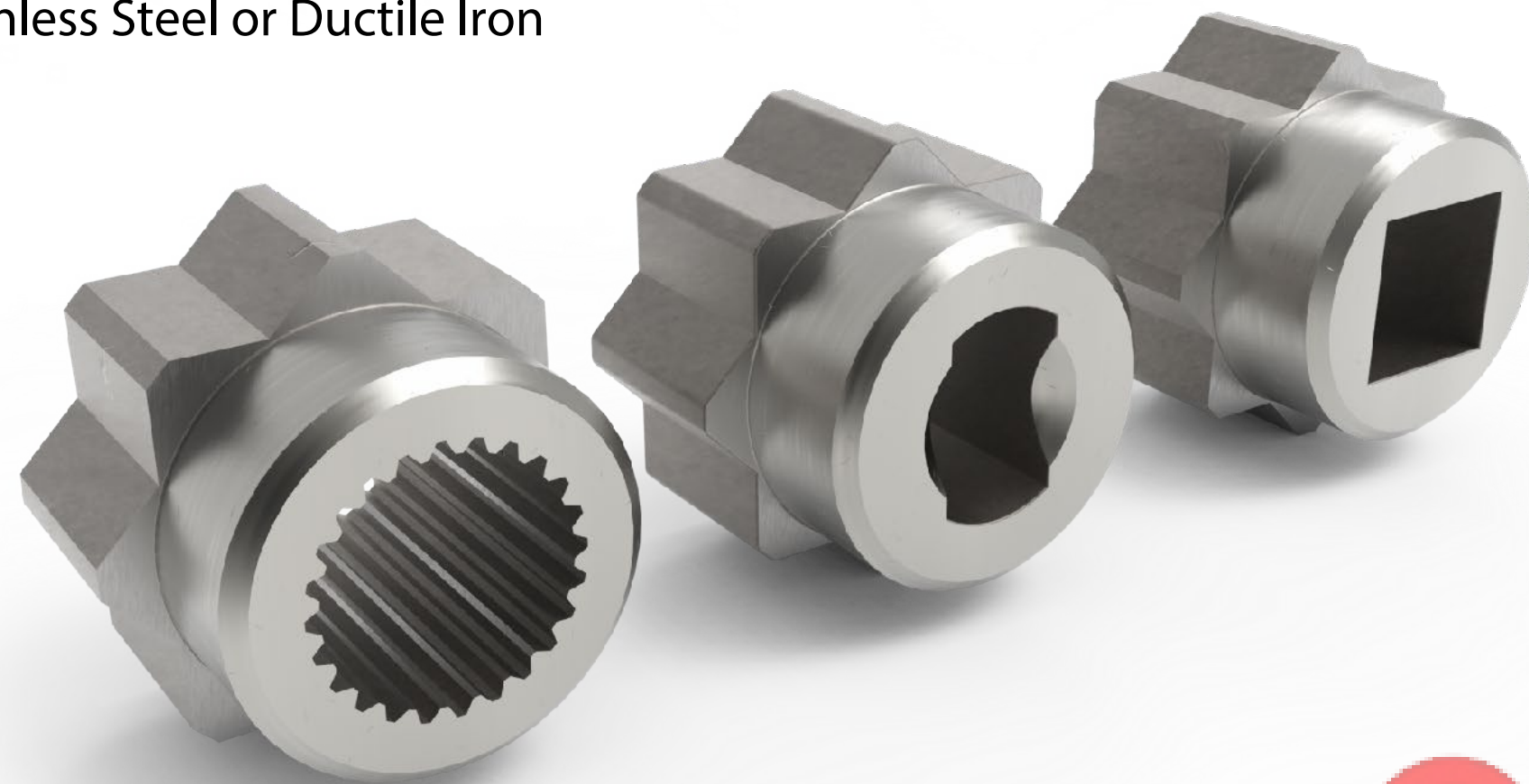
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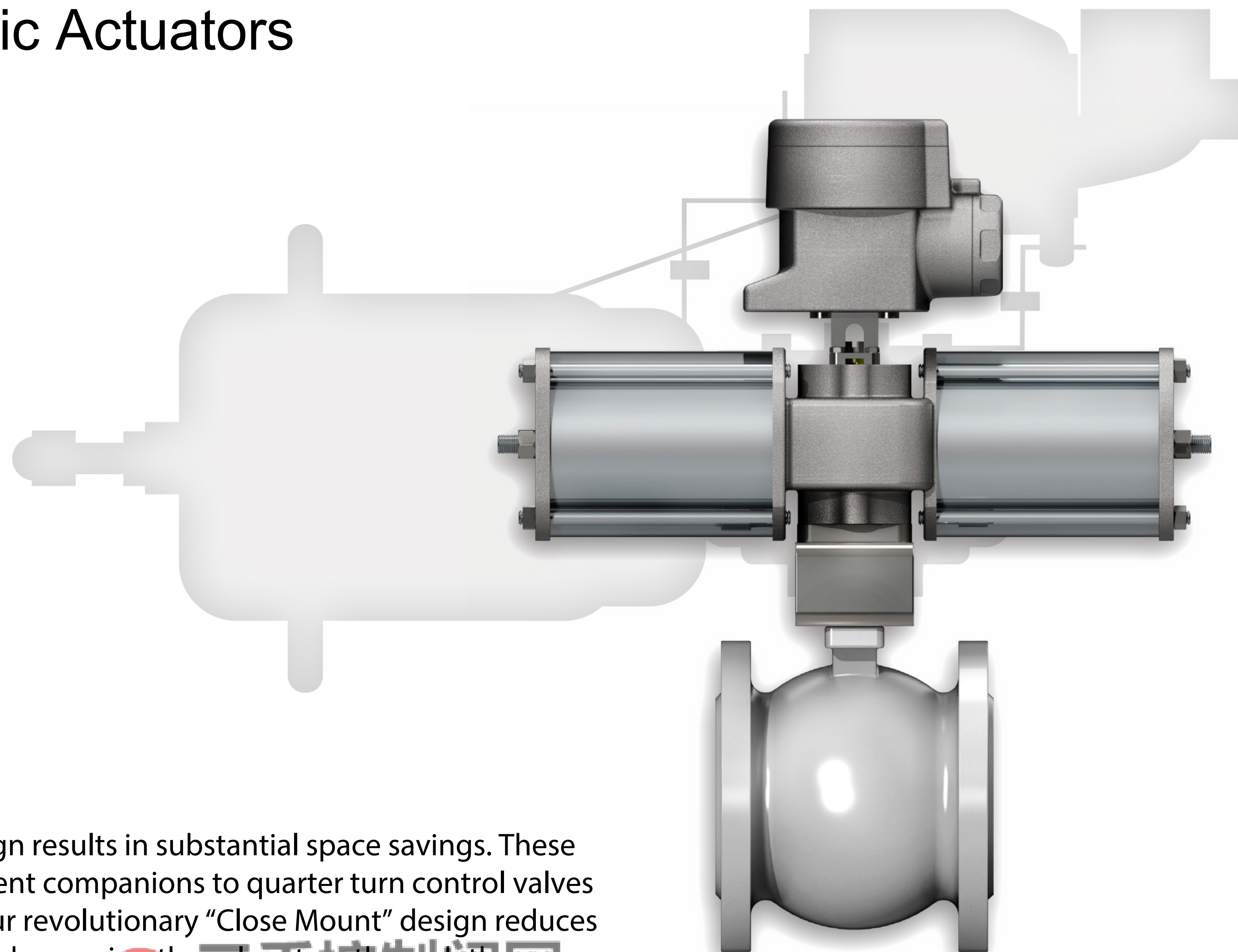
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SOLUTION:

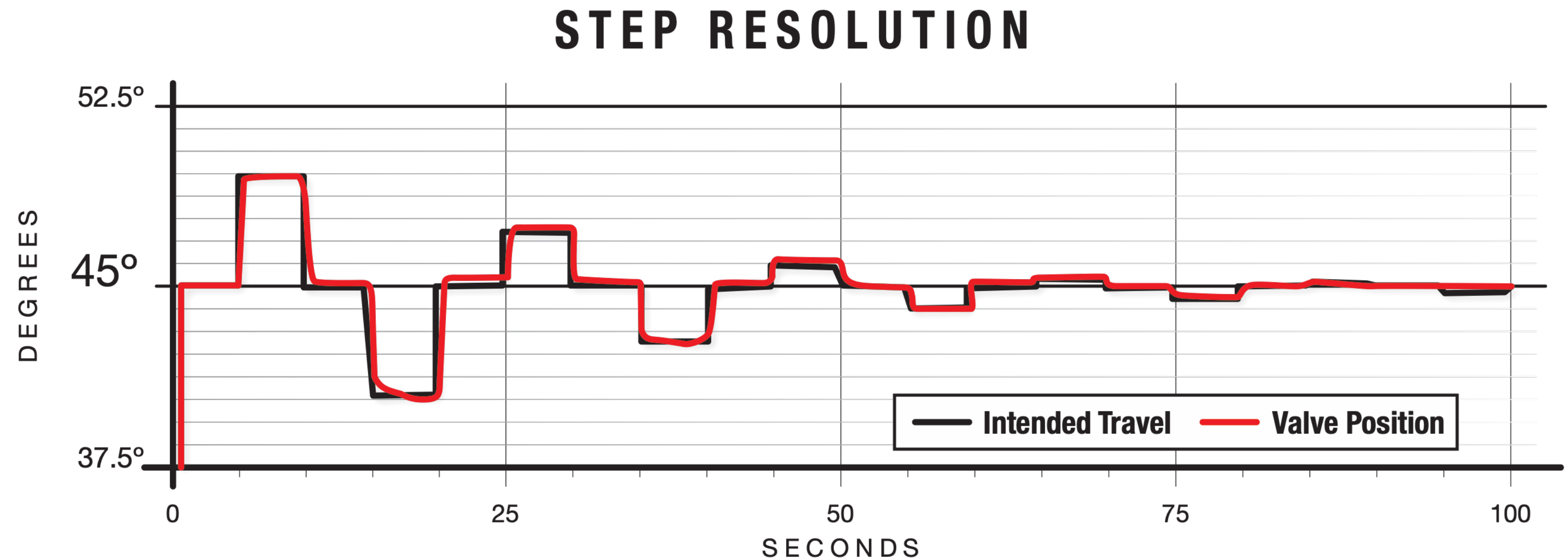
The QTRCO Rack & Gear® thru-shaft design results in substantial space savings. These actuators have been proven to be excellent companions to quarter turn control valves including those with extended stems. Our revolutionary “Close Mount” design reduces the size, weight and cost of the assembly by passing the valve stem through the actuator shaft with no valve modifications.



Differentiate Pneumatic Actuators

Q Series Rack & Gear®

Comprehensively tested for throttling applications the Rack & Gear® actuator can accurately and reliably position your control valve.



SOLUTION:

QTRCO Rack & Gear® Actuators have extremely low internal friction, consume minimal air volume, are able to handle the most severe vibration and are available in stainless steel for complete protection against corrosion. Rack & Gear® actuators provide throttling capabilities consistent with those of diaphragm actuators with a high level of reliability.

Differentiate Pneumatic Actuators

Q Series Rack & Gear®

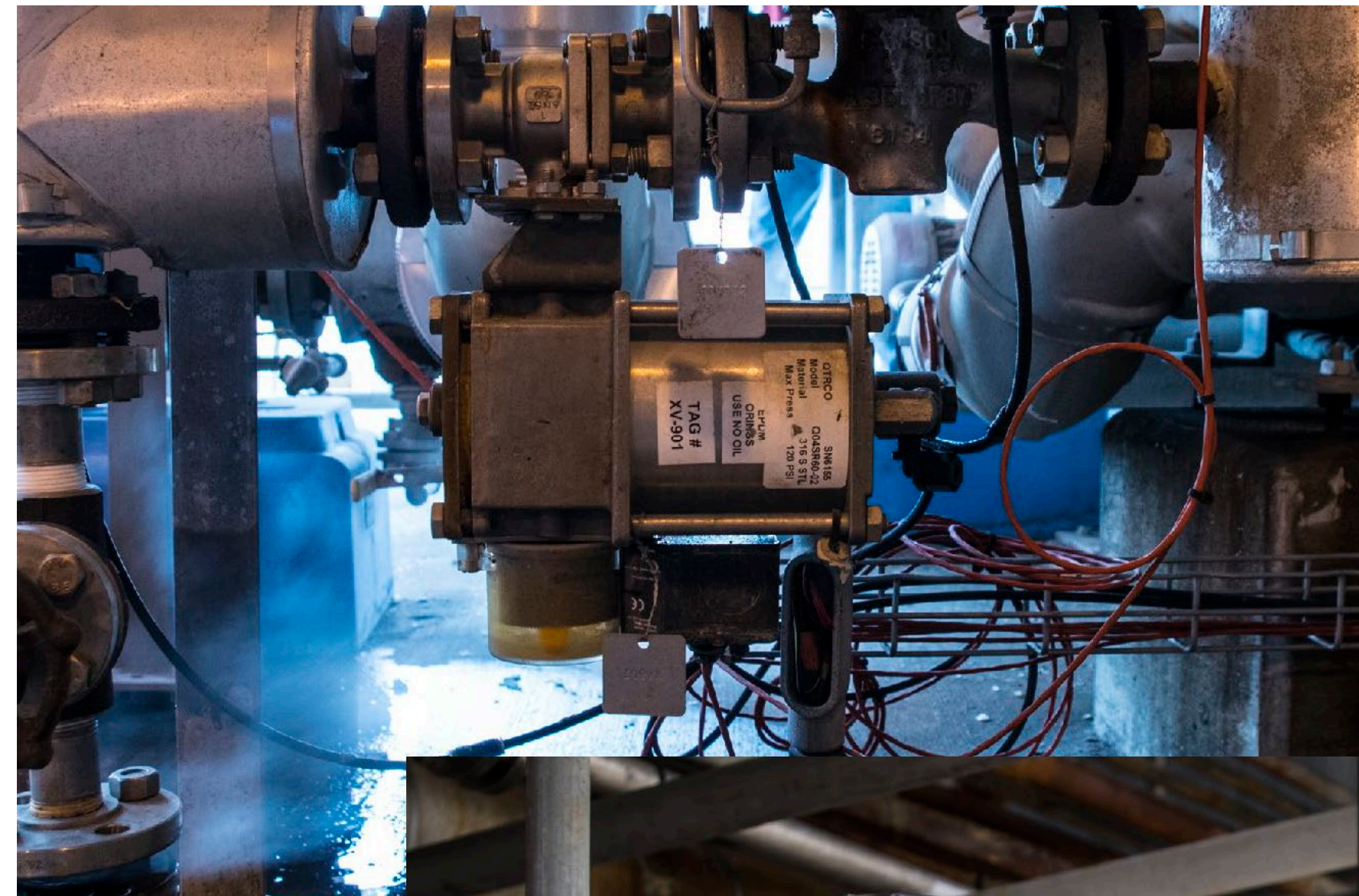
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Stainless Steel or Ductile Iron



Differentiate Pneumatic Actuators

F Series Flat Yoke®

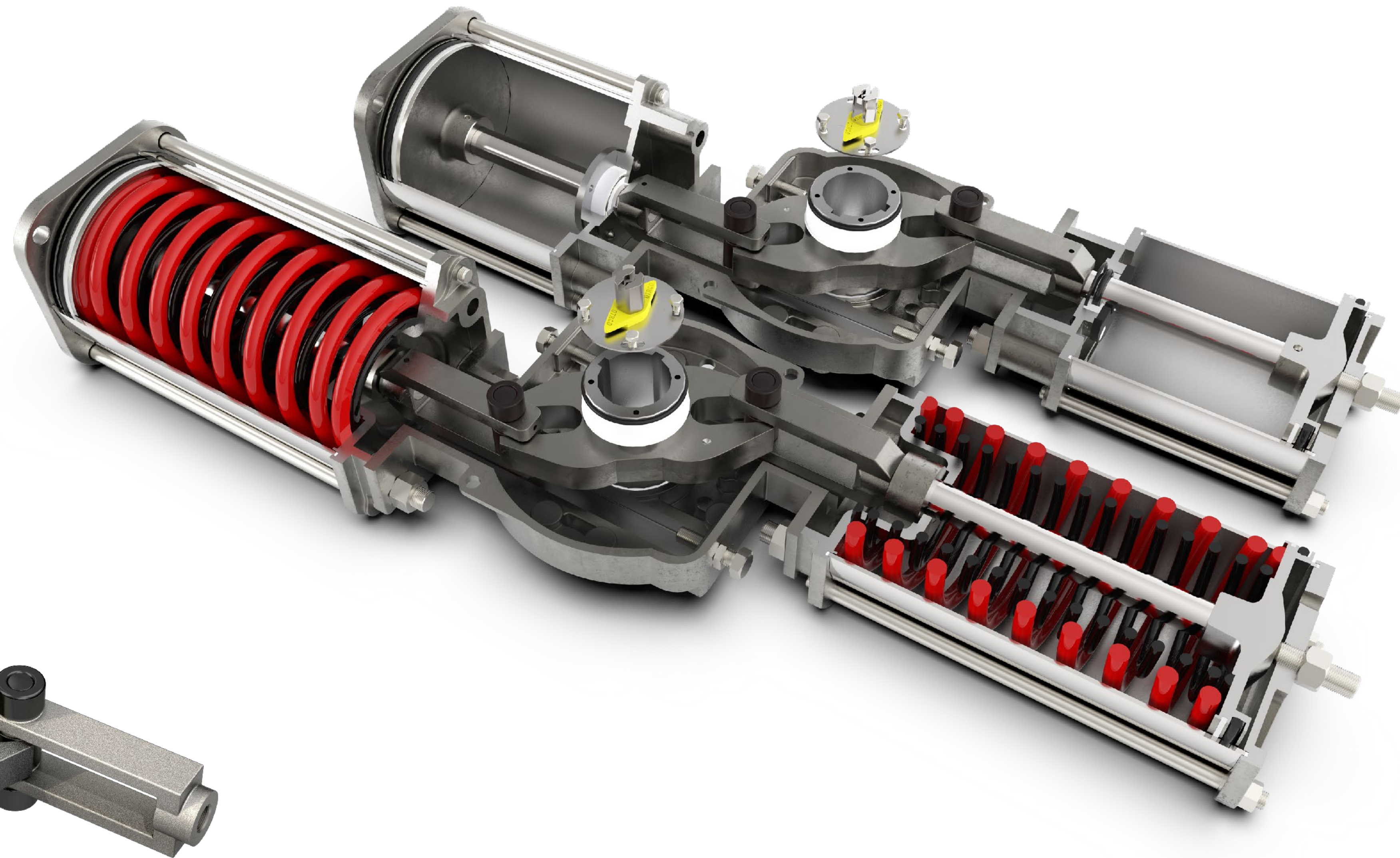
Temperatures
from -76°F to +450°F (-60°C to +232°C)

90° Rotation
(±5° at each end of travel)

Double acting & Spring return
Torques to 500,000 in-lb (56,492 Nm)

Operating Pressure
Pressure to 150 psig (10.3 bar)

Construction:
Stainless Steel or Ductile Iron



Differentiate Pneumatic Actuators

F Series

Flat Yoke®

Temperatures

from -76°F to +450°F (-60°C to +232°C)

90° Rotation

(±5° at each end of travel)

Double acting & Spring return

Torques to 500,000 in-lb (56,492 Nm)

Operating Pressure

Pressure to 150 psig (10.3 bar)

Construction:

Stainless Steel or Ductile Iron

Average = 48%



Differentiate Pneumatic Actuators

F Series Flat Yoke®

Temperatures
from -76°F to +450°F (-60°C to +232°C)

90° Rotation
(±5° at each end of travel)

Double acting & Spring return
Torques to 500,000 in-lb (56,492 Nm)

Operating Pressure
Pressure to 150 psig (10.3 bar)

Construction:
Stainless Steel or Ductile Iron



Differentiate Pneumatic Actuators

L Series

Linear®

Temperatures

from -76°F to 500°F (-60°C to 260°C)

Stroke

up to 4" (102 mm) Extended travel lengths available

Double acting & Spring return

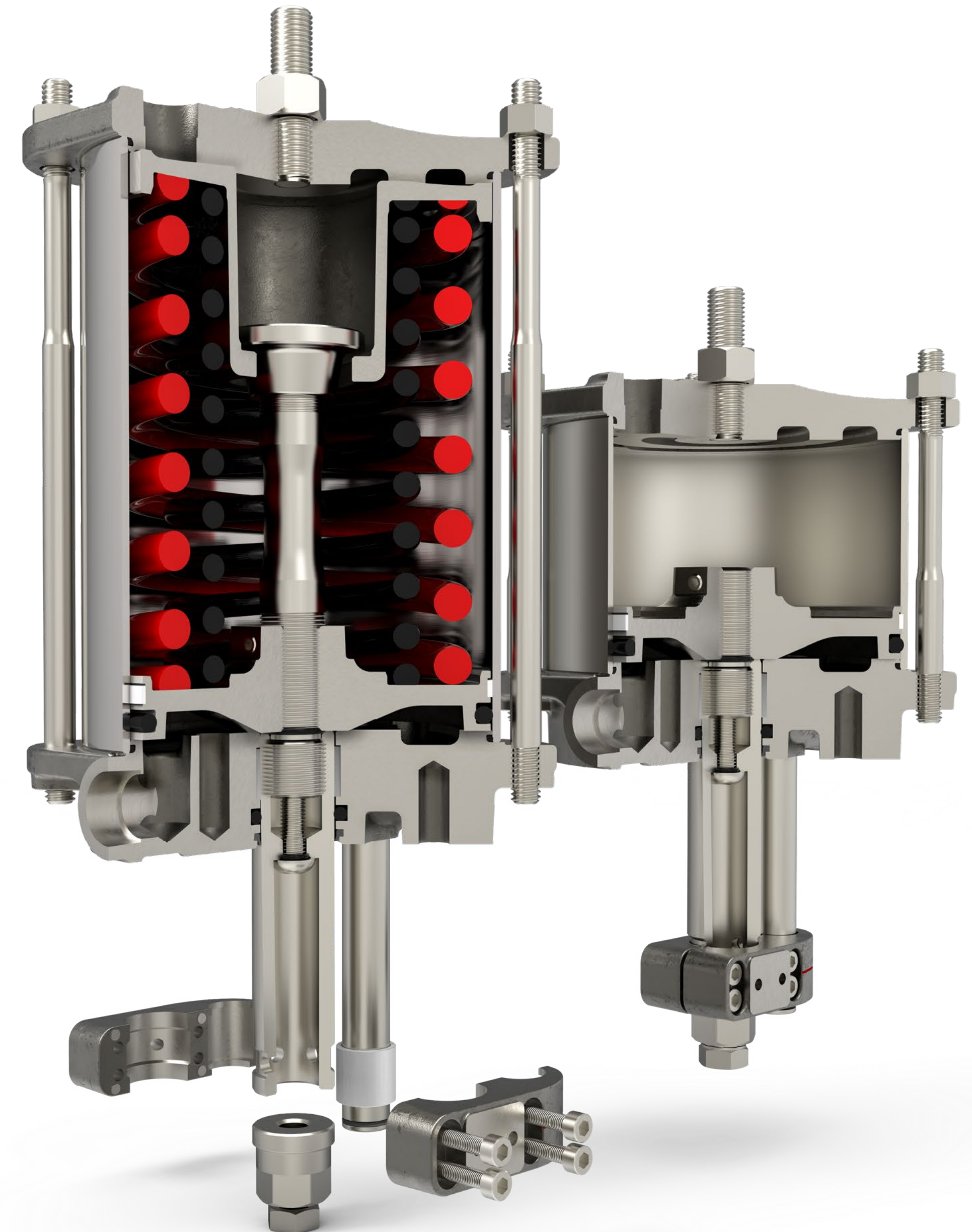
Thrust to 46,000 lbf (204,618 N)

Operating Pressure

Pressure to 150 psig (10.3 bar)

Construction:

Stainless Steel
or Ductile Iron



Differentiate Pneumatic Actuators

L Series
Linear®

SOLUTION - Impact Partner Exclusive Type-C (cast bra

Price to LBPs is comparable with Spring and Diaphragm actuators.



Differentiate Pneumatic Actuators

SOLUTION - Impact Partner Exclusive Type-C (cast bracket)

Price to LBPs is comparable with Spring and Diaphragm actuators.



Differentiate Pneumatic Actuators

MAXIMUM AVAILABILITY

Spring return actuator cylinders can be turned end-for-end and reinstalled to provide a new sealing surface

Non-Proprietary actuator seals are readily available and offer lower total cost of ownership

Captured springs located inward of pistons allow fast, safe and easy maintenance.

Customer saves labor, equipment and most of all downtime to maintain the actuator.

If Necessary...

Seal replacement is done in place, on the valve



APPLICATION SUCCESS STORIES



ADVANSIX – HOPEWELL, VA

Challenge

A polymer resin manufacturer uses acids in the production of their final product. Current valve actuators were experiencing corrosion affecting reliability.

Solution

The stainless steel L-Series actuator solves the corrosion issues and is compatible with all current controls and accessories.

Results

Customer is actively retrofitting problematic actuators with improved uptime and control valve performance.



ADVANSix

for Emerson internal use only

RAYONIER – JESUP, GA

Challenge

The steam pressure control valve to the digester is subjected to high vibration and the cast iron actuator yoke legs were fracturing causing unplanned downtime.

Solution

L-Series actuator with a stainless steel yoke was offered on a 6" Fisher ED valve. This reduced the total mass and moment arm acting on the actuator eliminating failure.

Results

Customer replaces actuators on all 28 digesters with QTRCO L-Series to improve pulp mill reliability.



PACKAGING CORPORATION OF AMERICA – DERIDDER, LA

Challenge

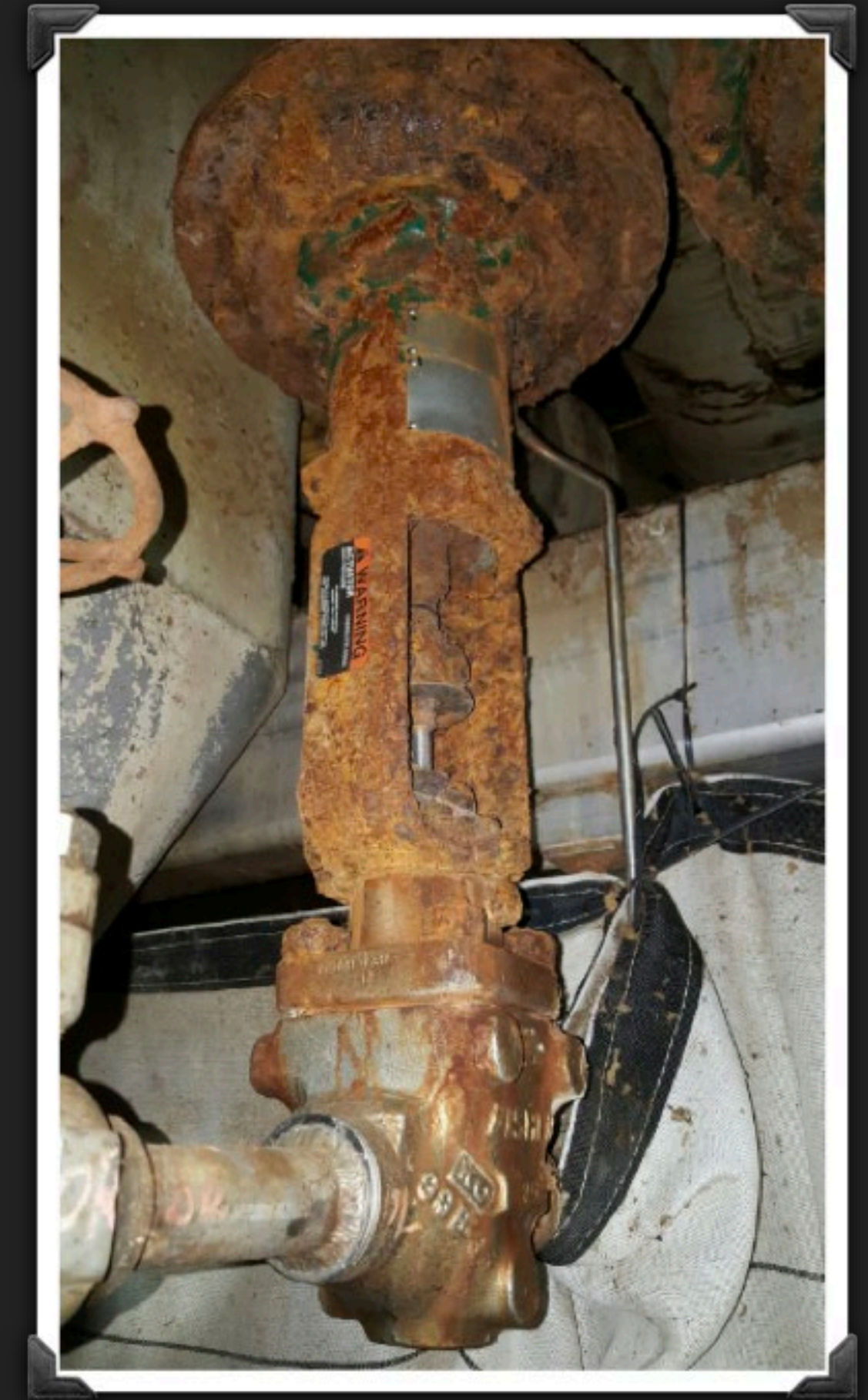
A water canon system is used to clean boiler tubes in a recovery boiler. The area is very wet and actuator corrosion is an ongoing issue.

Solution

The stainless steel L-Series actuator is a direct replacement alternative for the Fisher spring and diaphragm actuator offering superior corrosion resistance.

Results

Customer retrofits both soot blower valves with stainless steel actuators to eliminate maintenance issues.



PCS NITROGEN – AUGUSTA, GA

Challenge

Valve is required to provide a very quick response to rapidly changing pressures and flows. 16 Inch Fisher EWT globe control valve has 8.25 Inch travel and must open in less than 2 seconds

Solution

L Series linear actuator was designed to directly adapt to Fisher valve with no modifications. Provided exceptional control and exceeded customer performance specifications.

Results

Delivered the actuator in 6 weeks to meet the time constraints and budget needs of the project.



J.R. SIMPLOT – POCA TELLO, ID

Challenge

A major producer of liquid and dry fertilizer was experiencing ongoing corrosion issues with their Fisher control valve actuators. Chemicals falling on the actuators caused iron and steel component failure.

Solution

L Series actuators are a stainless steel alternative to Fisher linear actuators and eliminate the need for ongoing maintenance.

Results

A bolt-on replacement solution with no compromise in valve performance.



for Emerson internal use only

BOILER FEED WATER VALVE

Challenge

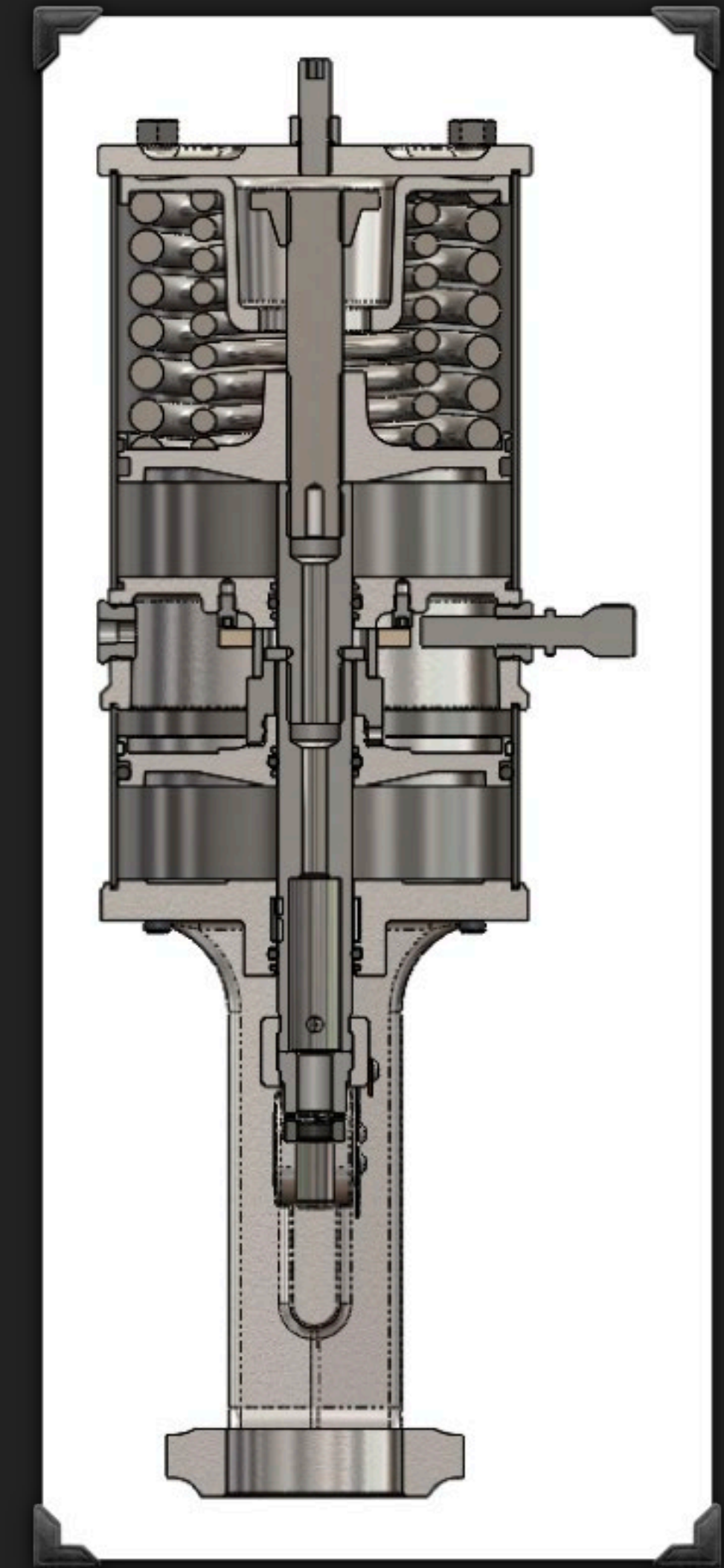
Rapidly filling the boiler drum on start up can damage standard valve trim. Customer characterized trims can prevent cavitation damage if applied correctly.

Solution

L Series linear actuator with Soft Start option has the ability to limit travel on start up and then fully open during normal operation.

Results

Customer cannot damage a very expensive valve trim set by filling the drum too quickly. Actuator is also able to provide sufficient seat load for Class V shutoff.



MAIN STEAM ISOLATION

Challenge

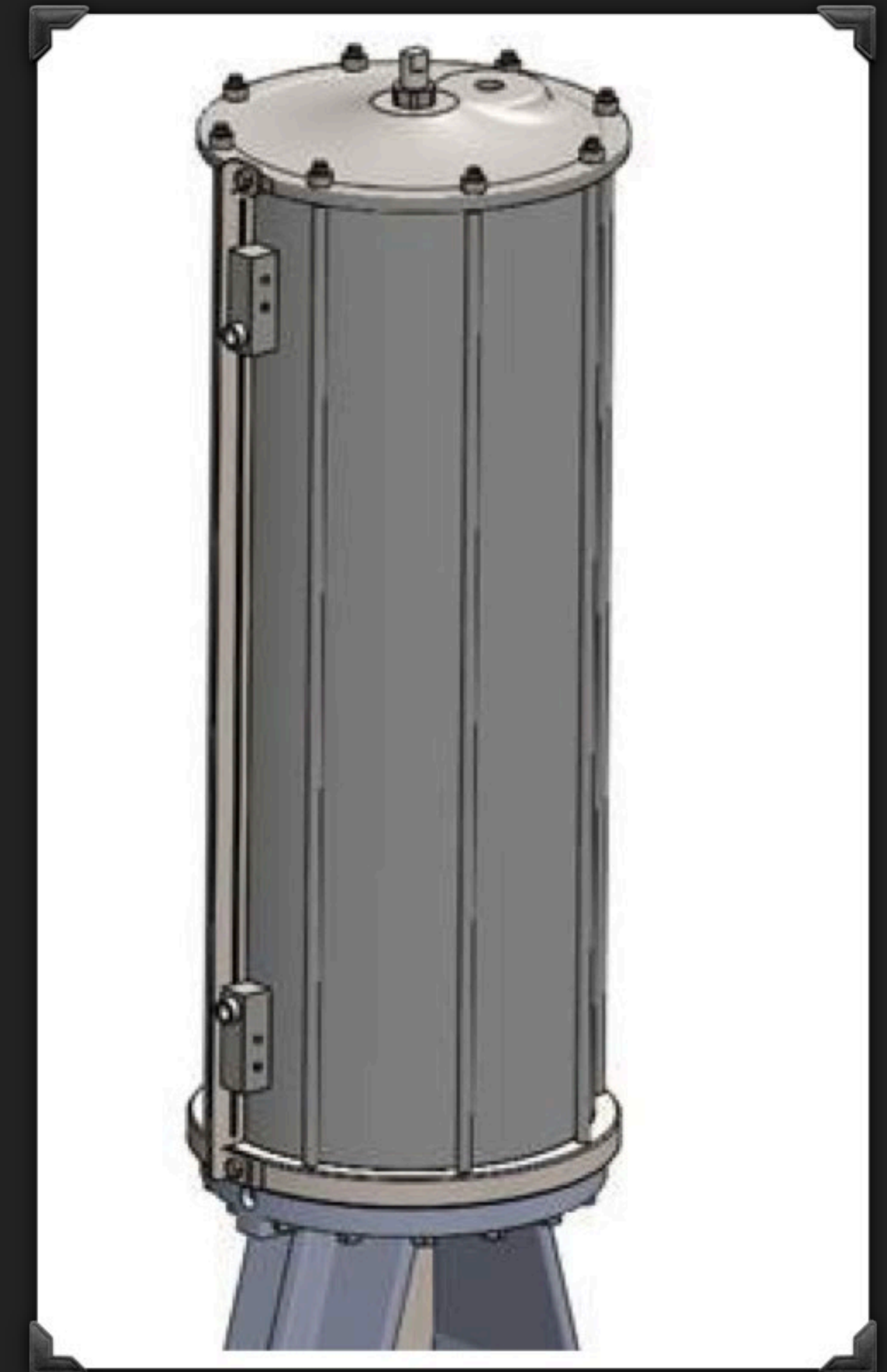
High pressures and temperatures combined with large pipe sizes make globe valves and ball valve impractical. Industry has adopted Parallel Slide Gate Valves for this service. Automation is challenging for these long travel valves.

Solution

L Series linear actuator is custom designed for any manufacture's valve to be a direct bolt on.

Results

Delivered custom solution for 30" and 36" valves ten weeks after receipt of order.



Differentiate Pneumatic Actuators

L Series

Linear®

Temperatures

from -76°F to 500°F (-60°C to 260°C)

Stroke

up to 4" (102 mm) Extended travel lengths available

Double acting & Spring return

Thrust to 46,000 lbf (204,618 N)

Operating Pressure

Pressure to 150 psig (10.3 bar)

Construction:

Stainless Steel
or Ductile Iron



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PROVEN RESULTS

Actuators & Applications



The Leader in Actuator Technology

QTRCO provides high quality valve actuators for a variety of industries.
Our goal is to supply actuators that do not encounter field service problems.

Chemical

PP/PE Reactor
Fertilizer Production
Compressor Anti-Surge
Main Steam Isolation
Sulphuric Acid Plant
Chemical Storage
Isolation

Food & Beverage

Corn Chip Extruder
Pepperoni Extruder
Grape Crushing
Soup, Stew, Juice

Oil & Gas

Natural Gas Metering
Pre-Load Ballast System

Fuel Gas Isolation
Heavy Crude Feed Filter
Neat Cat Gasoline
Compressor Discharge

Power

Compressor Bleed
Valves
Steam Turbine - Over

Speed Trip Valve
Fuel Gas Pilot - Over
Speed Trip Valve
Inlet Guide Vane

Pulp & Paper

Vacuum Valves
Soot Blower Valve
HD Bleached Pulp

Digester Steam Valve



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PROVEN RESULTS

Chemical - Lock Out/Tag Out



CHALLENGE

A global specialty chemicals company was experiencing significant time and expense to bi-annual shutdowns by having to remove valve actuators and installing lockable hand levers each outage.

SOLUTION

Actuators with [Top Mounted Lock Out \(TMLO\)](#) option allows the automated valves to be locked in the open or closed position in just seconds to ensure all workers are out of harm's way during maintenance shutdowns.

RESULTS

Customer retrofitted 16 storage tanks with TMLO devices ensuring safety, reducing downtime, and minimizing maintenance costs.

PROVEN RESULTS

Pulp & Paper - Wet End



CHALLENGE

The vacuum system on the “Wet End” of the paper machine is critical to forming the sheet and providing a quality product. Conditions are corrosive and conventional actuators do not last long in this service.

SOLUTION

[Q Series actuator](#) on a valve allows an all stainless steel design for longer service life and precise control.

RESULTS

Customer no longer replaces actuators every 2-3 years and is able to maintain system performance with no degradation in performance.

PROVEN RESULTS

Plastics - PP/PE Reactor



CHALLENGE

A global specialty chemicals company was experiencing significant time and expense to biannual shutdowns by having to remove valve actuators and installing lockable hand levers each outage.

SOLUTION

Actuators with [Top Mounted Lock Out \(TMLO\)](#) option allows the automated valves to be locked in the open or closed position in just seconds to ensure all workers are out of harm's way during maintenance shutdowns.

RESULTS

Customer retrofitted 16 storage tanks with TMLO devices ensuring safety, reducing downtime, and minimizing maintenance costs.

PROVEN RESULTS

Chemical - Steam Isolation



CHALLENGE

High pressures and temperatures combined with large pipe sizes make globe valves and ball valve impractical. Industry has adopted Parallel Slide Gate Valves for this service. Automation is challenging for these long travel valves.

SOLUTION

[L Series linear actuator](#) is custom designed for any manufacture's valve to be a direct bolt on.

RESULTS

Delivered custom solution for 30" and 36" valves ten weeks after receipt of order.

PROVEN RESULTS

Fuel Gas Pilot - Over Speed Trip (OSV)



CHALLENGE

Customer requires High Reliability/ Repeatability and Fast Acting valve/ actuator closing speeds of 0.2 seconds or less to prevent turbines from over speeding.

SOLUTION

[Q & F Series Actuators](#) are readily available with oversized ports to accommodate rapid and consistent closing speed requirements.

RESULTS

Customer was able to confidently protect their assets from damage, by demonstrating the Actuator will trip on demand, closing the valve in 0.1 seconds.

PROVEN RESULTS

Steam Turbine - Over Speed Trip (OSV)



CHALLENGE

Customer requires High Reliability, High Temp. and Fast Acting valve/ actuator closing speeds of 0.3 seconds or less to prevent turbines from over speeding. Customer also required quick delivery.

SOLUTION

[Q & F Series actuators](#) are readily available with oversized ports to accommodate closing speed requirements, and high temp trim suitable to 400°F

RESULTS

Actuator was delivered in 6 weeks as promised to ^{SEP}meet customers request and meets/ exceeds stroke ^{SEP}speed requirement.

PROVEN RESULTS

Steam Power - Fuel Gas Isolation



CHALLENGE

Fuel Gas Isolation valve to a combustion turbine ^[SEP]required a SIL-2 rated assembly that had Partial Stroke Testing capabilities to allow extended intervals between full stroke testing.

SOLUTION

[F Series actuator](#) was supplied with a 12" full bore floating ball valve. [XRCISER](#) option was specified due to capabilities without compromise.

RESULTS

Customer was pleased with the performance of the valve assembly with PSTD and purchased a second ESD for their other combustion turbine.

QTRCO - Pneumatic Actuators

Information & Resources

- Sales Literature - Features and Benefits
- Product Bulletins - Technical details
- IOMs - Installation, Operations and Maintenance instructions

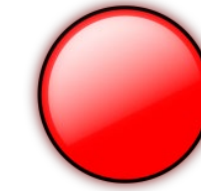
Internal Resources

- Sales Guide
- Sizing Tool - Torque Tables & Safety Margin Calculations.
- Price List
- Engineering Calculations - Stroke Speed Calculations, Spring Rates Etc.

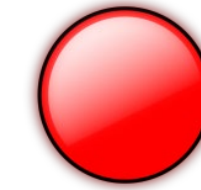


What is required of a PSTD:

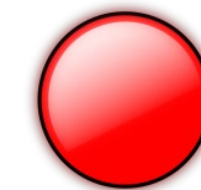
That it be safe in that it will not itself, prevent valve closure in case of an emergency



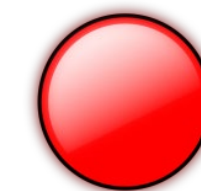
That it provide useable information regarding the valve's health



That it does not disrupt plant operation

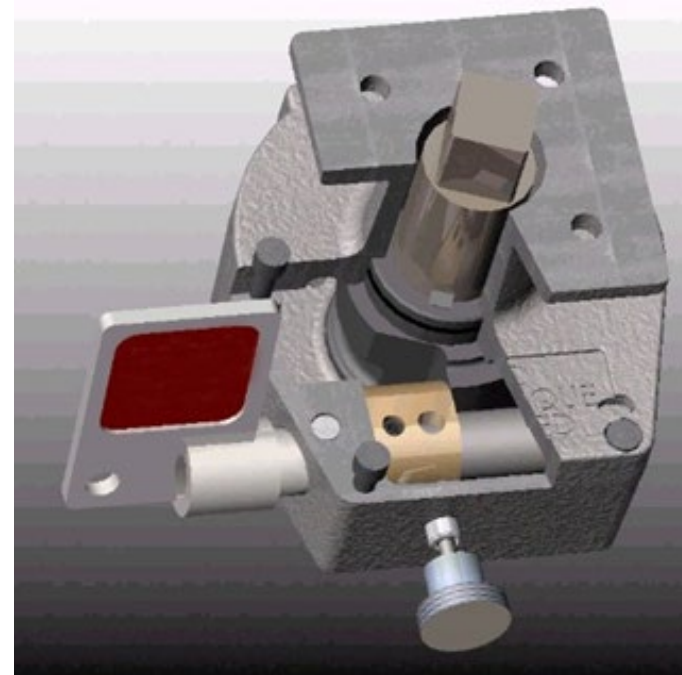


That it does not generate false failures

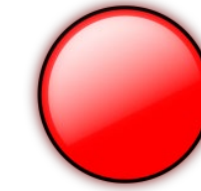


Input from users: *None of the PSTDs with which they are familiar are capable of satisfying all of these requirements*

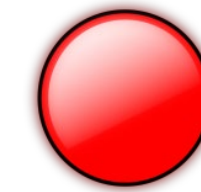
What is required of a PSTD:



That it be safe in that it will not itself, prevent valve closure in case of an emergency



That it provide useable information regarding the valve's health



That it does not disrupt plant operation

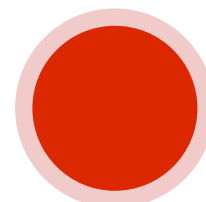


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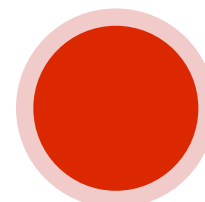


Mechanical Systems: *Satisfy 3 & 4, but fail 1 & 2*

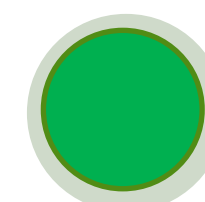
Additionally:



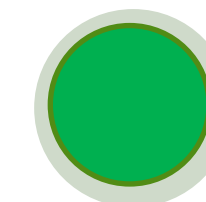
Extensive operator training – subject to error



Multiple vendors, requires mating with actuator



Provides 100% of actuator torque



PST and ESD speeds are unaffected

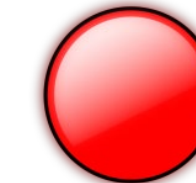
What is required of a PSTD:



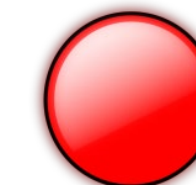
That it be safe in that it will not itself, prevent valve closure in case of an emergency



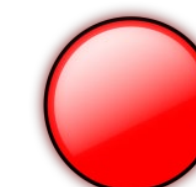
That it provide useable information regarding the valve's health



That it does not disrupt plant operation

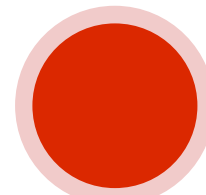


That it does not generate false failures

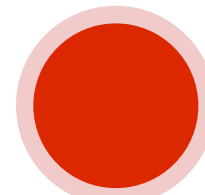


Instrumented Systems: *Satisfy 1, but fail 2,3 & 4*

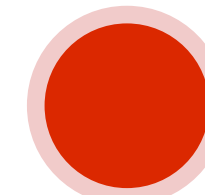
Additionally:



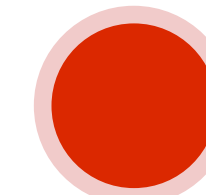
Provides very small % of actuator torque



Significant impact on ESD speeds



Complicated & costly installation



Affected by actuator size

What is required of a PSTD:



That it be safe in that it will not itself, prevent valve closure in case of an emergency



That it provide useable information regarding the valve's health



That it does not disrupt plant operation

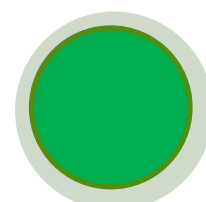


That it does not generate false failures

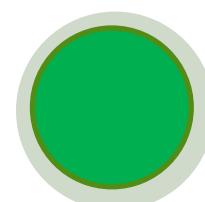


XRCISER®: *Satisfies 1 - 4*

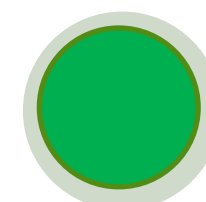
Additionally:



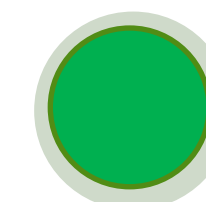
Low cost consultant - free installation



Not affected by actuator size or process changes

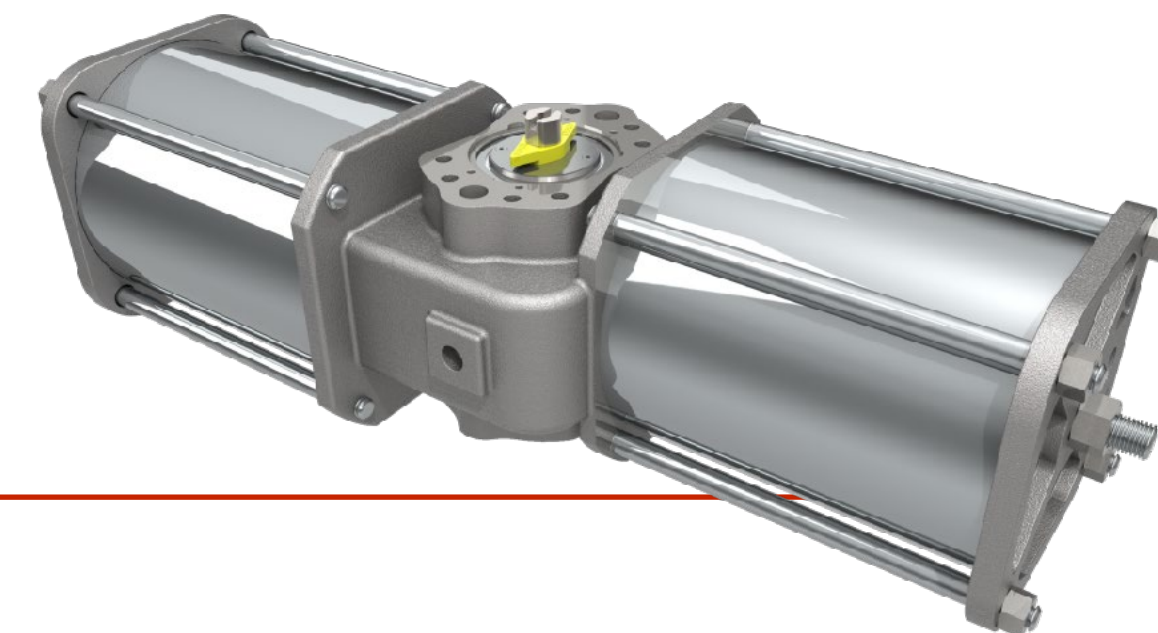


Provides 100% of actuator torque



PST and ESD speeds are independent

The standard QTRCO actuator uses a travel stop screw in the end cap to limit outward travel of the actuator piston, and therefore valve travel.



What is it?

Basic spring return actuator with pneumatically engaged positive PS travel stops.

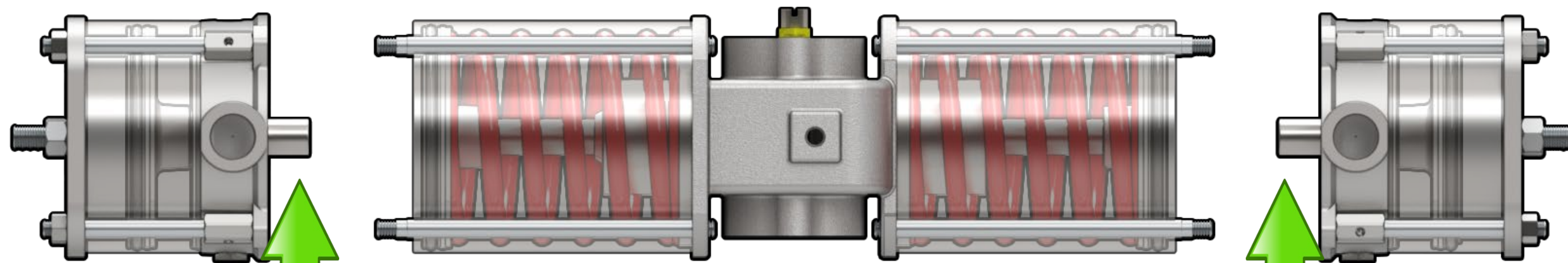


How does it function?

A retrofittable, stroke limited tandem piston is pneumatically positioned to disallow actuator travel beyond the desired PS position

XRCISER[®] PSTD solution

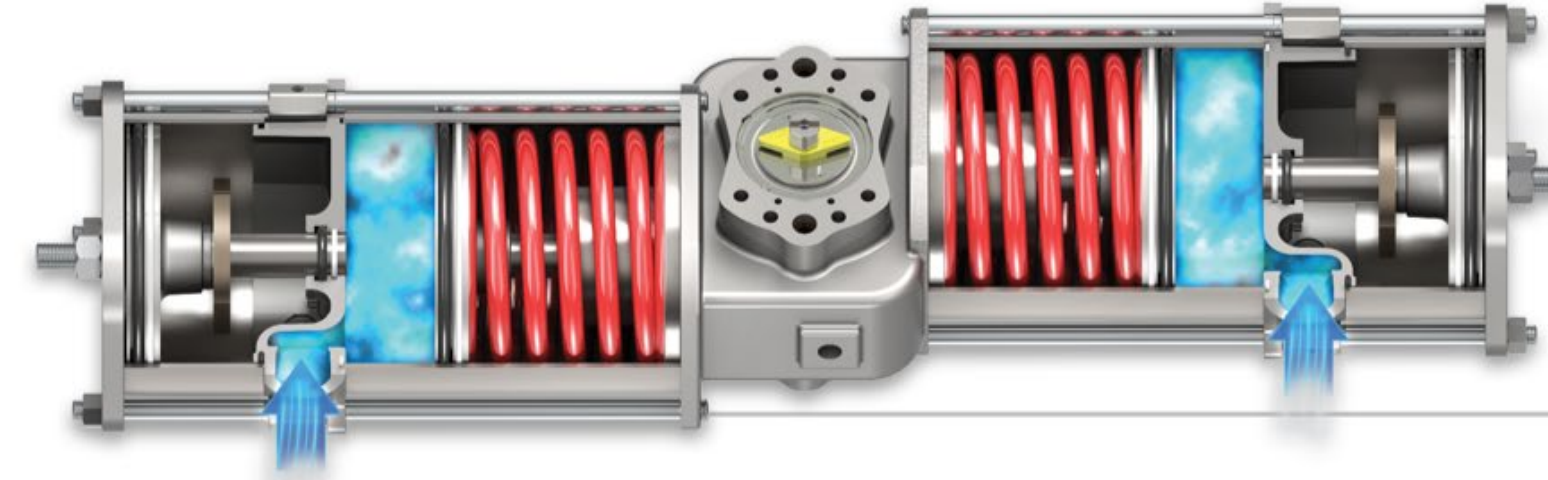
Tandem pistons serve as pneumatically engaged travel stops on any QTRCO Rack & Gear[®] or Flat Yoke[®] actuator



Positive travel stops eliminate spurious travel

By confirming tandem piston pressure and position;
spurious valve travel is prevented during the partial stroke cycle.

XRCISE® PSTD solution - Operation



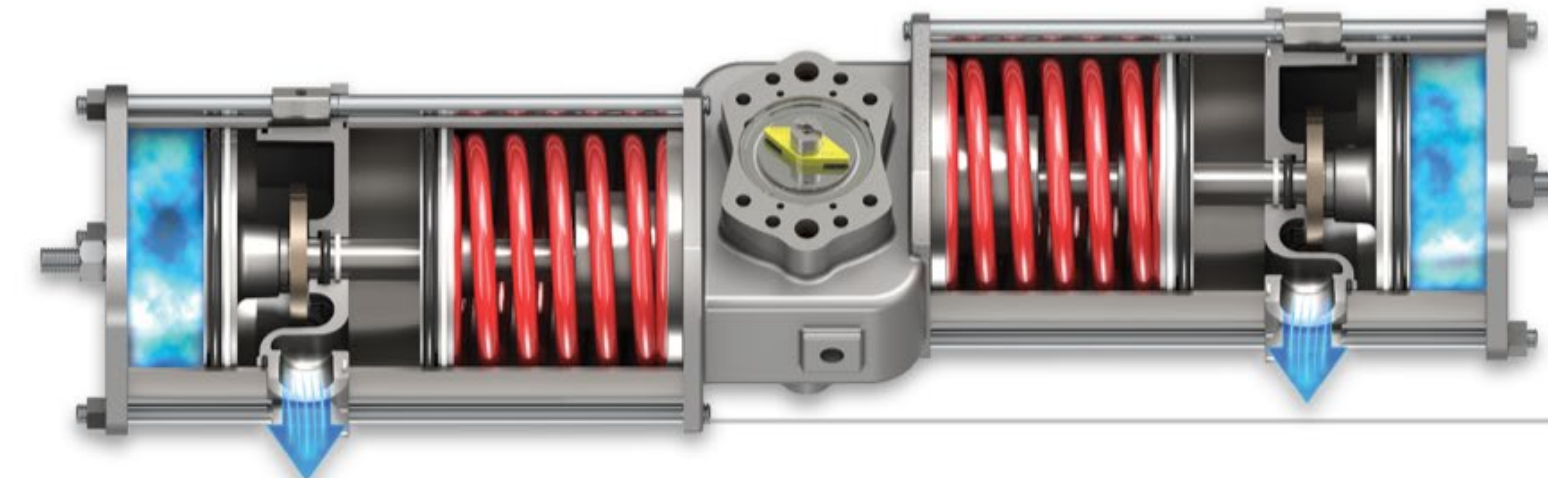
1. Normal Service

Primary pistons are pressurized and the valve is in the full travel position



2. Tandem Pistons Pressurized

readiness is confirmed by proximity and pressure switches, the valve remains in the full travel position



3. Partial Stroke Test

pressure is exhausted from primary pistons and the springs push the primary piston outward, the pressurized tandem piston limits the travel to 15° (or customer specified amount), then actuator returns to normal service



Positive travel stops eliminate false failures

What is required of a PSTD:

XRCISER[®] PSTD solution –
Plant Safety

That it be safe in that it will not itself, prevent valve closure in case of an emergency



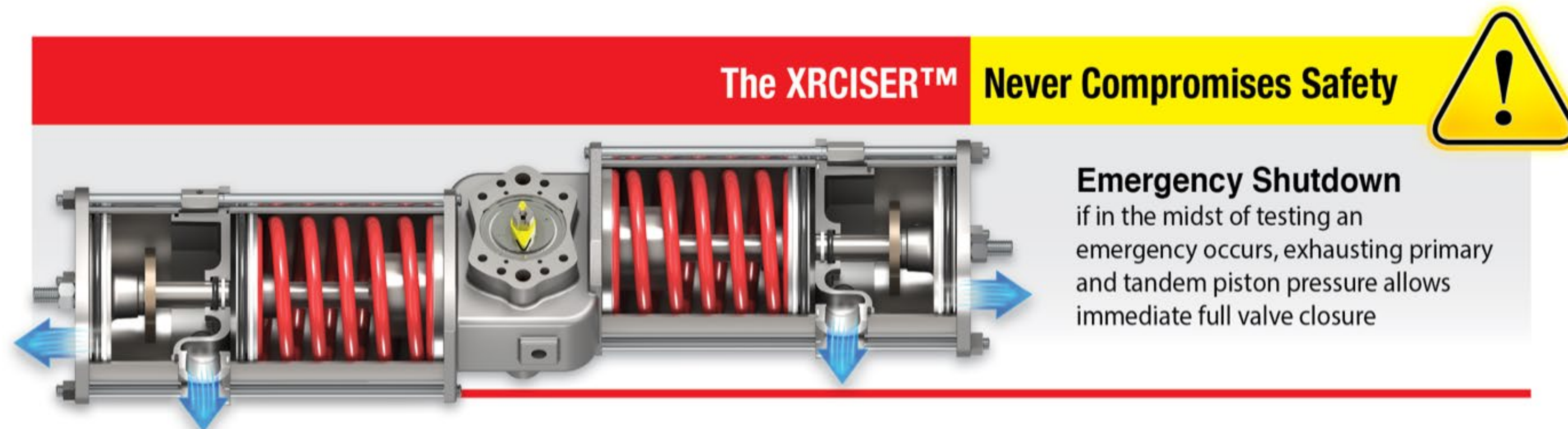
That it provide useable information regarding the valve's health



That it does not disrupt plant operation



That it does not generate false failures



What is required of a PSTD:

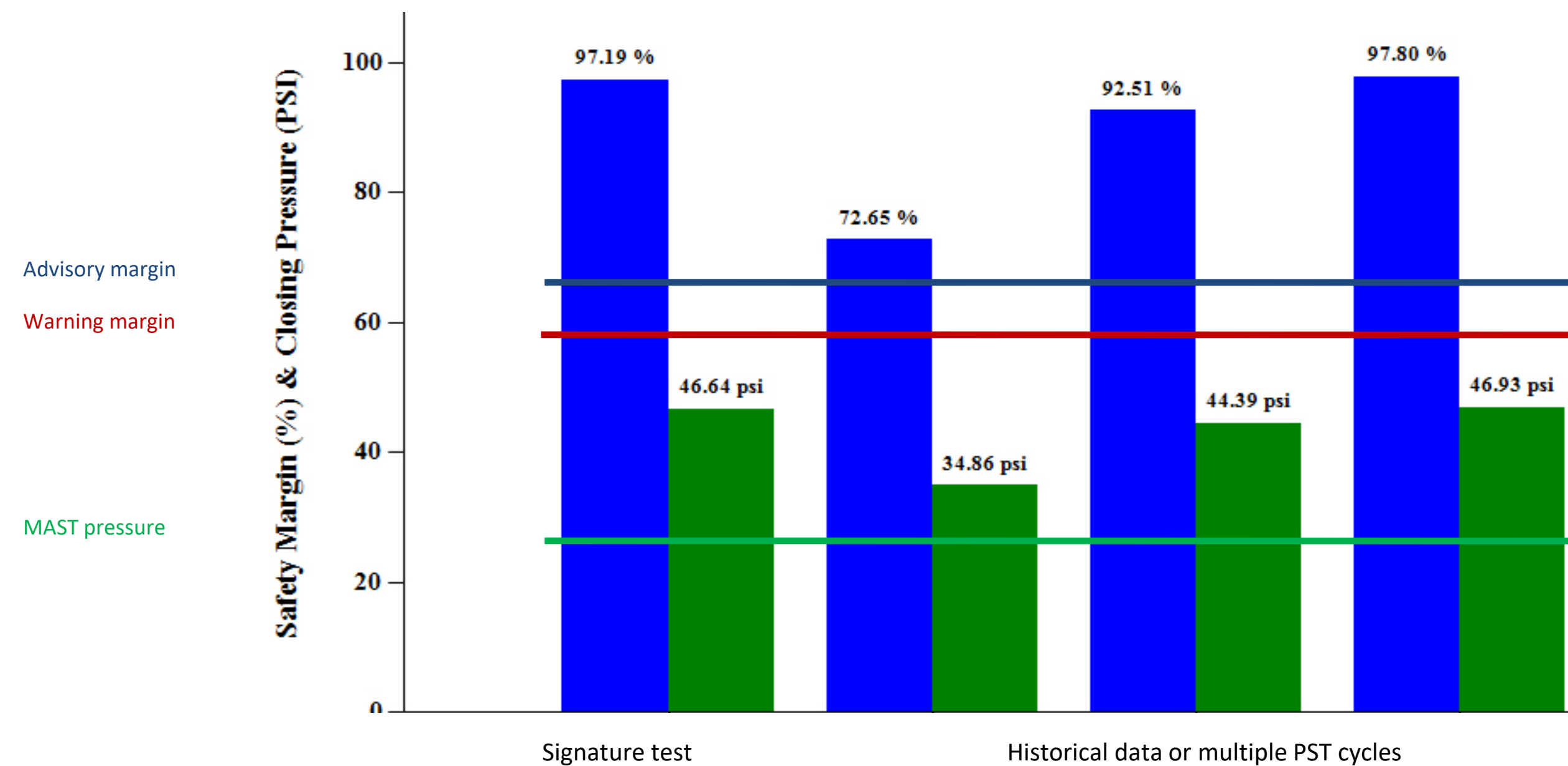
That it be safe in that it will not itself, prevent valve closure in case of an emergency



That it provide useable information regarding the valve's health



That it does not disrupt plant operation



The XRCISER® satisfies
all requirements of a
PSTD

It is **safe** in that it will not itself, prevent valve
closure in case of an emergency



It **provides useable information** regarding the
valve's health



It does **NOT** disrupt plant operation

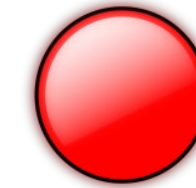


It does **NOT** generate false failures

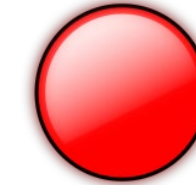


Why instrumented systems are problematic:

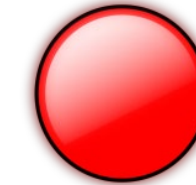
They rely on pressure control to achieve the PS travel position



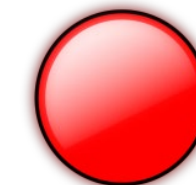
They provide only a small % of the available actuator torque



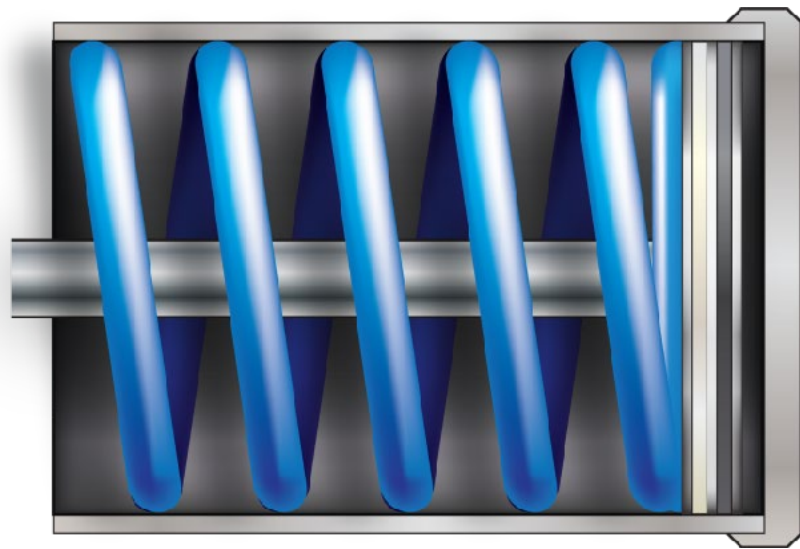
Process parameters, corrosion, debris etc. can increase resistance to motion



Inability to decrease pressure to a value below that applicable to the PS position mandates aborting the PST if time and pressure parameters are not within programmed limits

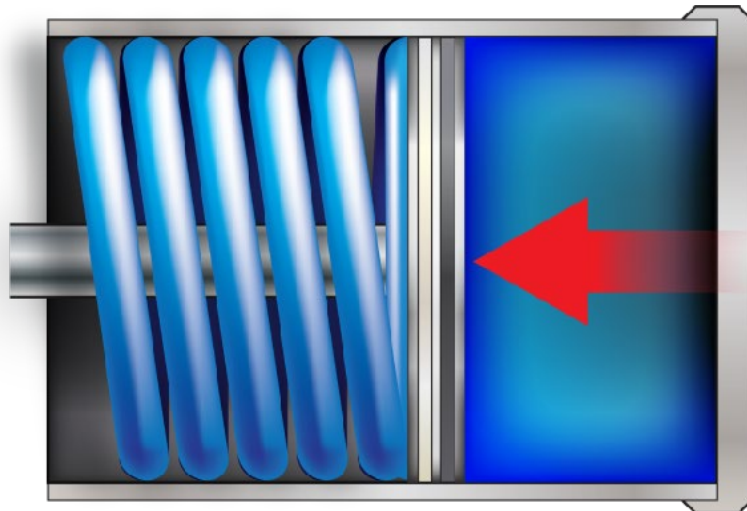


Full travel of spring return actuators occurs over a small pressure range



Air pressure = 0 to 32 psig
Initial spring force = 32
psig equivalent

Zero travel position (No valve attached)
Motion does not occur until pressure
force exceeds the initial spring force

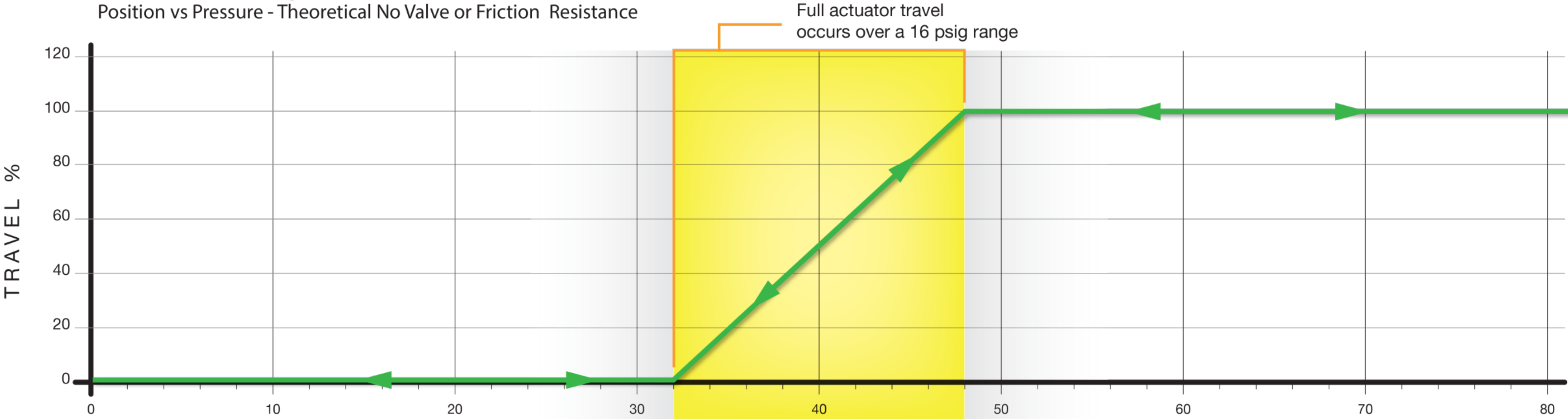


Air pressure = 48 to 80 psig
Full travel spring force = 48
psig equivalent

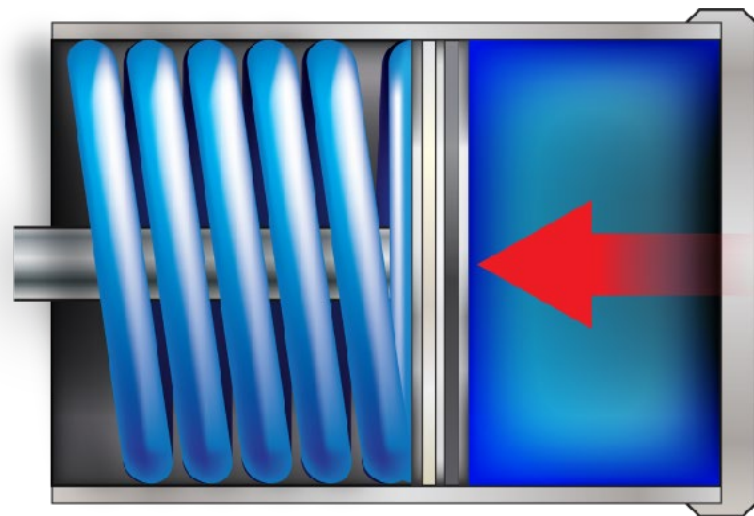
Full travel position (No valve attached)
No further travel occurs regardless
of increasing pressure

Pressure Change vs Actuator Travel

Position vs Pressure - Theoretical No Valve or Friction Resistance

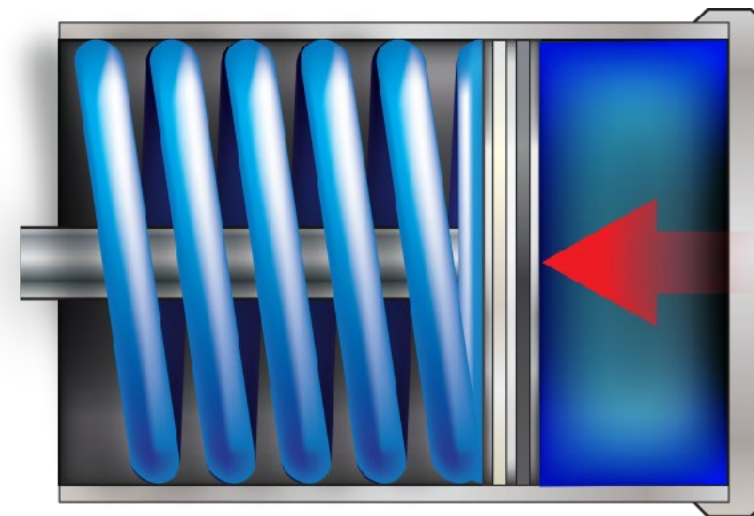


The basic premise of the pressure control method of Partial Stroke Testing is to slowly exhaust pressure until the spring causes movement to the PST position.



Full (100%) travel position

Air pressure = 80 to 48 psig
No movement until pressure falls below 48 psig

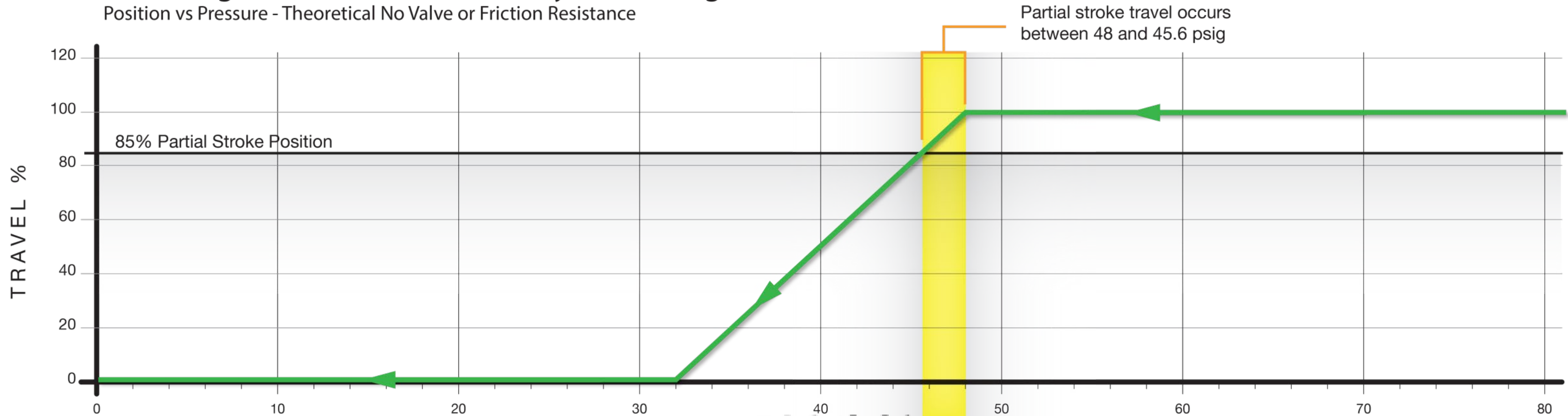


85% travel position

Air pressure = 45.6 psig
PST position is reached when pressure falls from 48 to 45.6 psig

Achieving Partial Stroke Position by Exhausting Pressure

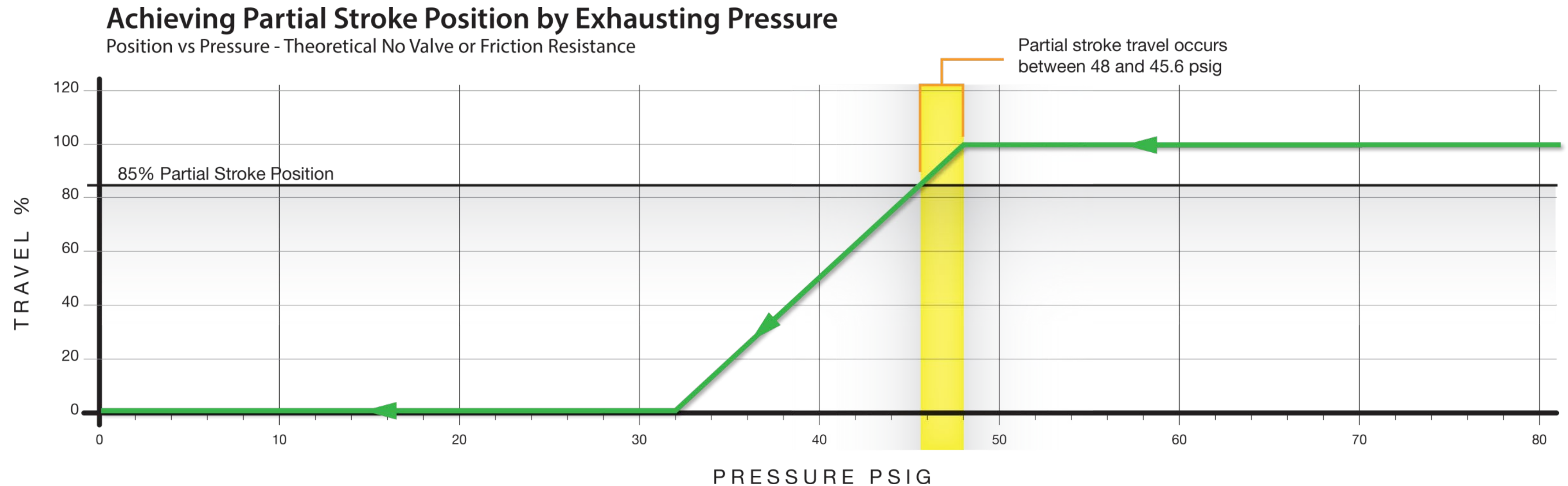
Position vs Pressure - Theoretical No Valve or Friction Resistance



Full travel position (No valve attached)

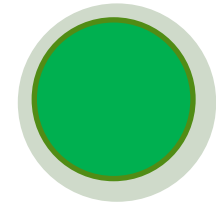
Zero spring torque is applied and motion does not occur until pressure decreases to below 48 psig

Available torque



- Any PSTD using pressure release to perform partial stroke testing is inherently deficient in its ability to consistently meet user expectations

FAQs



In the previous example, what is the effect of having the valve attached ?

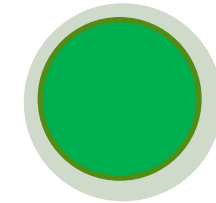
The example demonstrates how little actuator torque is applied by instrumented systems to overcome blockages or other obstacles to motion.

Systems are tuned with the valve attached and with a pristine valve and actuator the assembly can be shown to function as applicable to the user's desires. Valve friction is present but the system settings inherently take these initial valve and actuator losses into consideration.

However, once the process is operational, pressure and flow cause changes in the valve's resistance to motion. In some instances pressure against the valve element causes friction to increase while flow can increase, decrease or turn negative the dynamic torque acting on the valve. Over time, corrosion and debris buildup also change the valve's resistance to motion.

Even minimal changes in valve resistance, due to the minimal available actuator torque output, will impact the operating parameters and may well force the system to abort the PST.

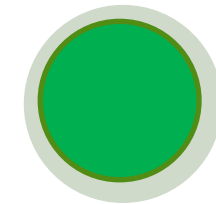
FAQs



With an instrumented system, it is possible to modify the valve travel position to wipe away built up debris. Is this possible with the XRCISER® ?

The XRCISER® has one fixed travel position, however by observing pressure changes while performing multiple PSTs, the user can assess whether debris is being swept away as the initial motion will become easier with each additional cycle.

Varying travel with an instrumented system may provide confidence that debris is being dislodged but there is no confirmation of this nor is there any awareness whether a significant blockage is being created at maximum travel position.



Is it possible to combine an instrumented system with an XRCISER® ?

Yes, absolutely. The instrumented system can be employed but with some modification to engage the XRCISER®

Summary - the
XRCISER® satisfies all
requirements of a PSTD

It is safe in that it will not itself, prevent valve
closure in case of an emergency



It provides useable information regarding the
valve's health



It does NOT disrupt plant operation



It does NOT generate false failures





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