



Zimmerman

Pneumatic



Balancers

Balancer Advanced

A red ribbon graphic with a central cylindrical section. The word "Objectives" is written in bold black text with a white outline on the central section.

Objectives

- Balancer Operation
- Balancer Maintenance
 - Control Function
- Control Adjustment & Installation



Summary

- The Balancer has smooth operation, variable capacity, multiple control choices, multiple mounting options and minimal air consumption.
- Understanding the operation and function of the balancer and various controls is an important factor in the proper use of the balancer system.

Module Preview

- If a balancer with ZA controls allows a load to drift to the floor in less than a minute what is the cause?
- When facing the end cover which direction does the reel rotate?
- If air pressure is released from the piston chamber the load will _____.
- Which control is best suited for a lifting application?

BALANCER CONFIGURATION



BASIC BALANCERS

**10 inch diameter
200, 350 & 500 lb.
Capacity**



**6.5 inch diameter
150 lb. Capacity**





Operating Capacity

- **Determined by Air Pressure**
 - “Plant Operating” Pressure
- **Rated Capacity @ 100 psi**

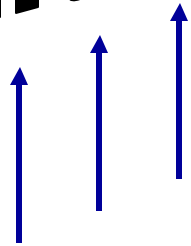
Operating Capacities

Plant operating air pressure (PSI)	50 lb. Balancer operating capacity	150 lb. Balancer operating capacity	200 lb. Balancer operating capacity	350 lb. Balancer operating capacity	500 lb. Balancer operating capacity
100	50	150	200	350	500
90	45	135	180	315	450
80	40	120	160	280	400
70	35	105	140	245	350
60	30	90	120	210	300

- **Air Pressure ÷ 100 = Capacity Factor**
50 psi ÷ 100 = .50 Factor

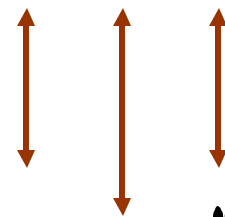
- **Capacity Factor x Rated Capacity = Operating Capacity**
.50 x 350 = 175 lb.

Lifting Applications



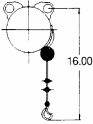
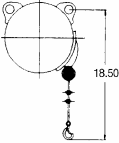
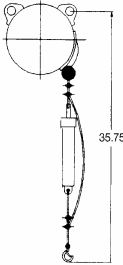
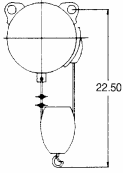
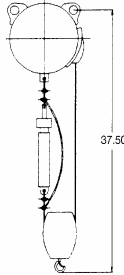
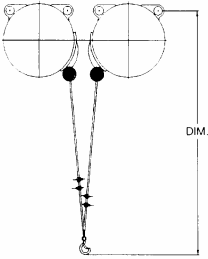
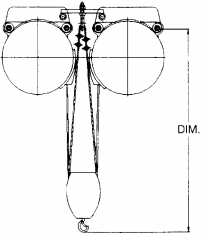
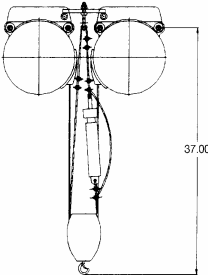
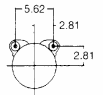
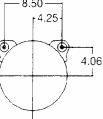
Use maximum of 80% of capacity

Balancing Applications



Use a maximum of 60% of capacity

Reeved & Tandem

<p>SINGLE</p>  <p>CAPACITY TRAVEL DIM. 150 LBS. 80 IN. 16.0 IN.</p>	<p>SINGLE</p>  <p>CAPACITY TRAVEL DIM. 200 LBS. 120 IN. 18.5 IN. 350 LBS. 80 IN. 18.5 IN. *500 LBS. 80 IN. 18.5 IN.</p>	<p>SINGLE W/ "Z" SERVO</p>  <p>CAPACITY TRAVEL DIM. 200 LBS. 120 IN. 35.75 IN. 350 LBS. 80 IN. 35.75 IN. *500 LBS. 80 IN. 35.75 IN.</p>	<p>REEVED</p>  <p>CAPACITY TRAVEL DIM. 400 LBS. 60 IN. 22.5 IN. 700 LBS. 40 IN. 22.5 IN. *1000 LBS. 40 IN. 22.5 IN.</p>	<p>REEVED W/ "Z" SERVO</p>  <p>CAPACITY TRAVEL DIM. 400 LBS. 60 IN. 37.5 IN. 700 LBS. 40 IN. 37.5 IN.</p>
<p>TANDEM</p>  <p>CAPACITY TRAVEL DIM. 400 LBS. 120 IN. 35.25 IN. 700 LBS. 80 IN. 40.25 IN.</p>	<p>TANDEM REEVED</p>  <p>CAPACITY TRAVEL DIM. 800 LBS. 60 IN. 27.25 IN. 1400 LBS. 40 IN. 37.25 IN. 2000 LBS. 40 IN. 37.25 IN.</p>	<p>TANDEM REEVED W/ "Z" SERVO</p>  <p>CAPACITY TRAVEL DIM. 800 LBS. 60 IN. 37.0 IN. 1400 LBS. 40 IN. 37.0 IN. 2000 LBS. 40 IN. 37.0 IN.</p>	<p>EAR LOCATIONS ON 6.5 IN. CAN</p>  <p>EAR LOCATIONS ON 10 IN. CAN</p> 	

*Supplied with chain.

Travel

- **Total Rope > Reel Capacity**
- **Travel = High Point - Low Point**
- **Reeved Travel = 1/2 Straight Travel**

Balancer Capacity	Length of Rope (Feet)	Straight Travel (Inches)	Reeved Travel (Inches)
50 lb.	12	60	N/A
150 lb.	20	80	N/A
200 lb.	30	120	60
350 lb.	30	80	40
500 lb.	30	80	40

EXERCISE 1

Capacity

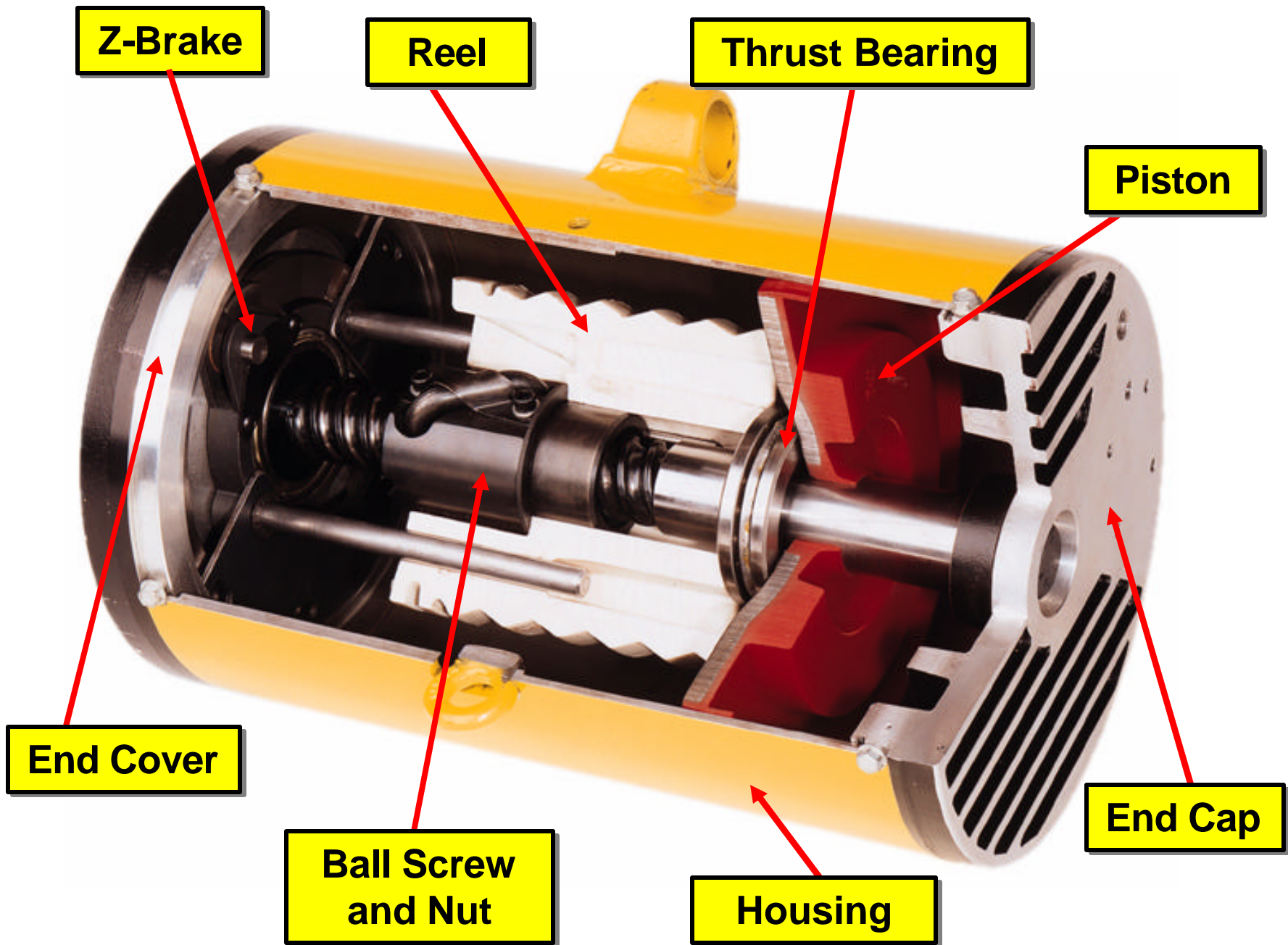
Models

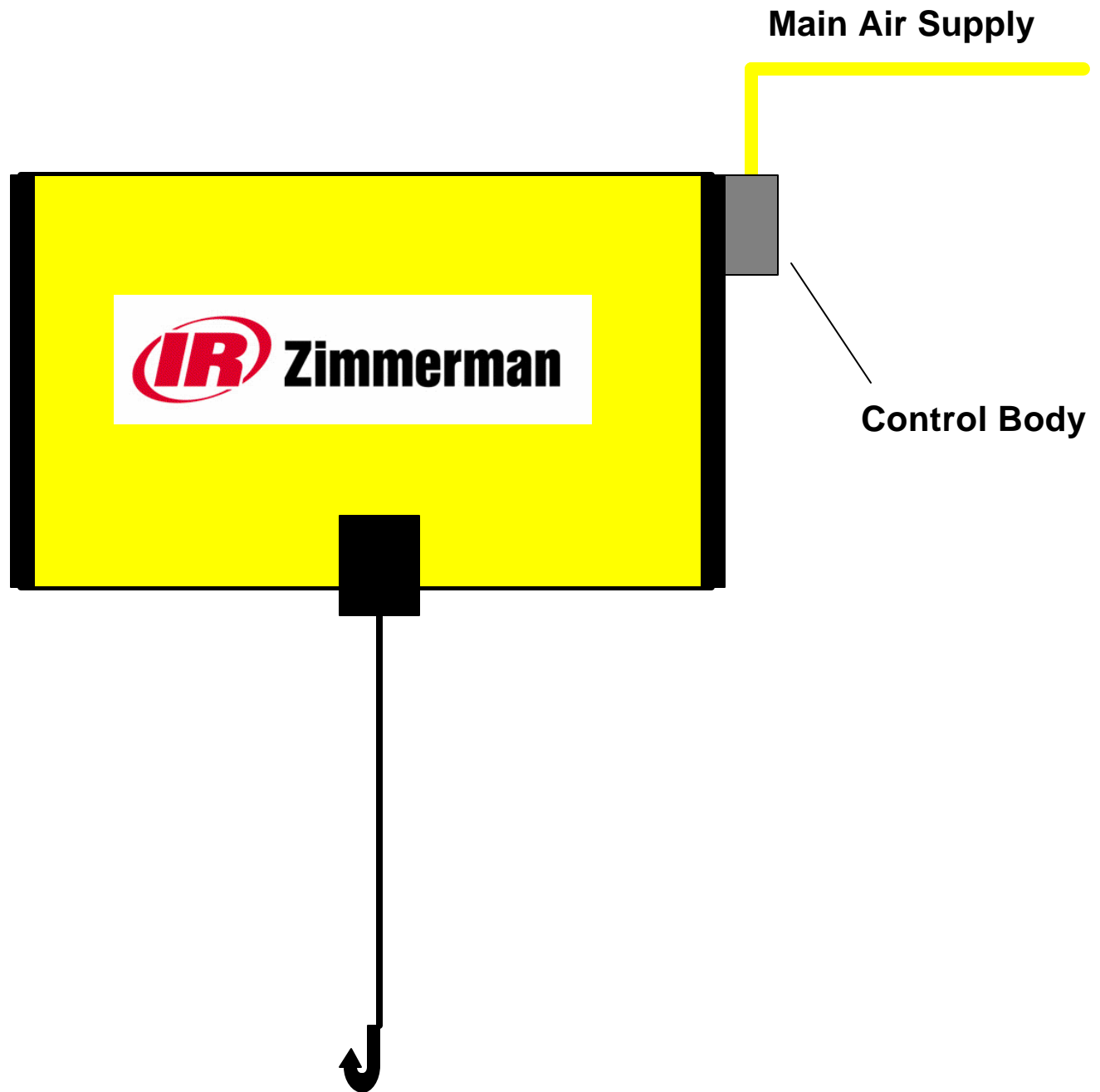
Travel



Balancer

Function



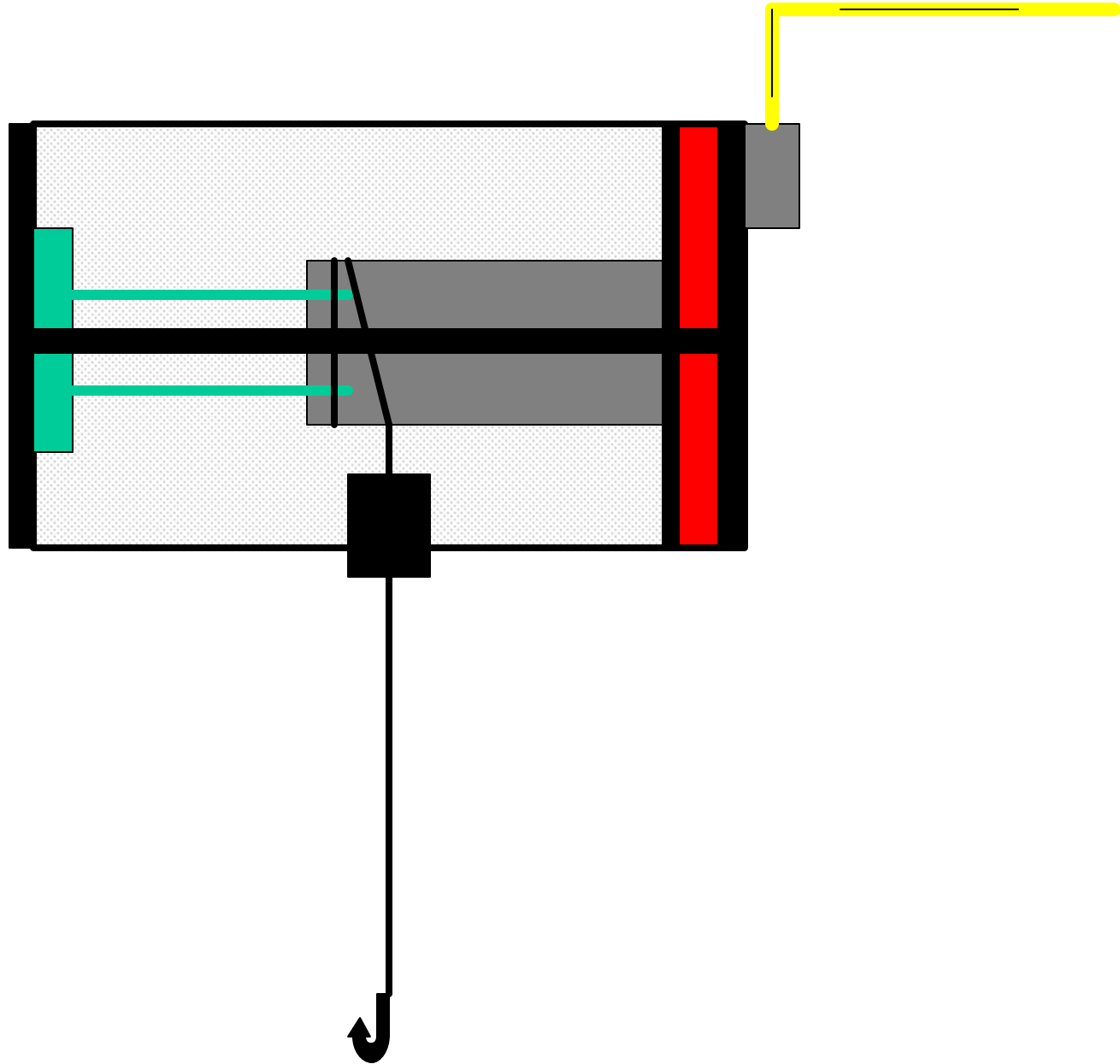


Main Air Supply

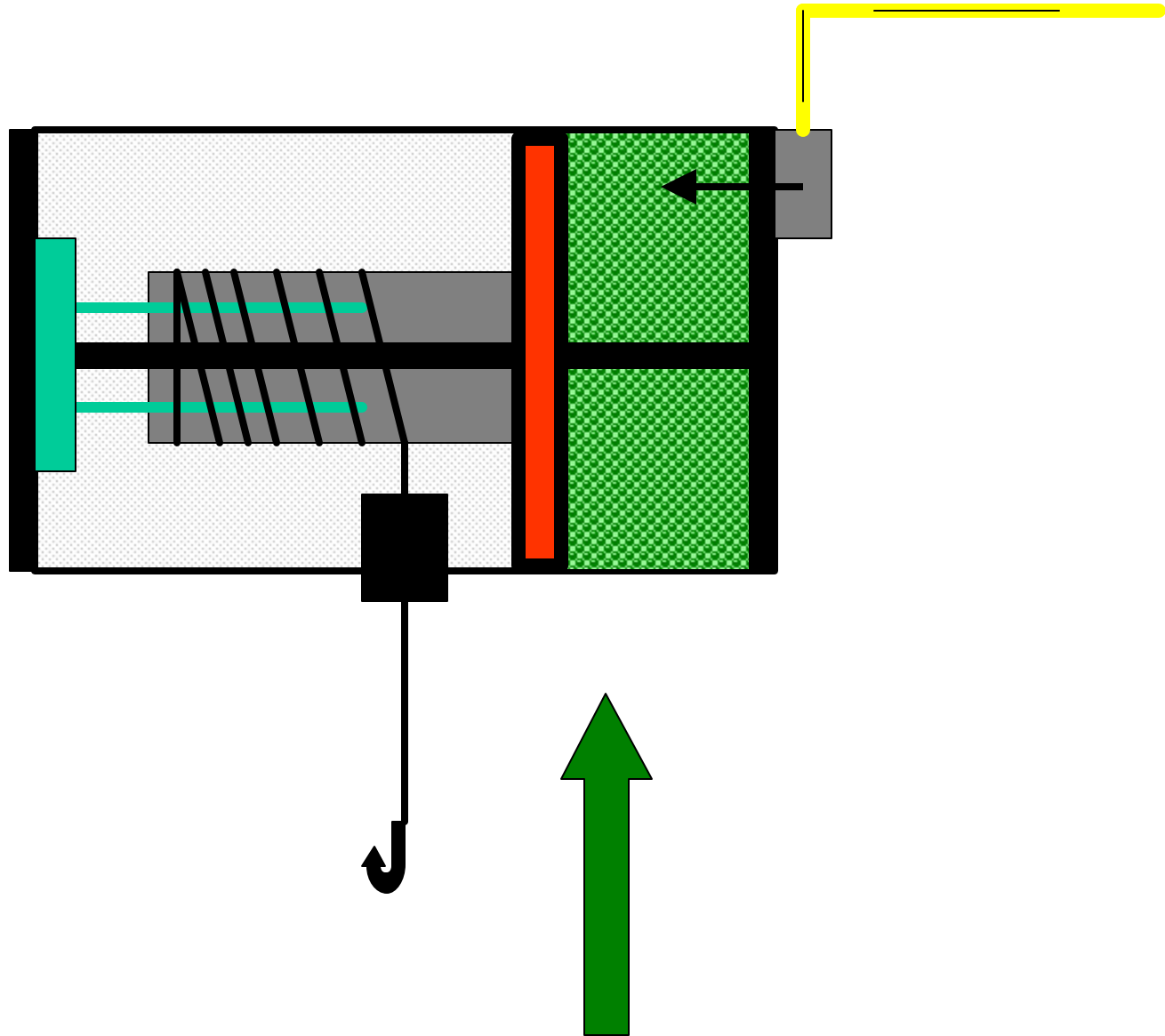
Control Body

IR Zimmerman

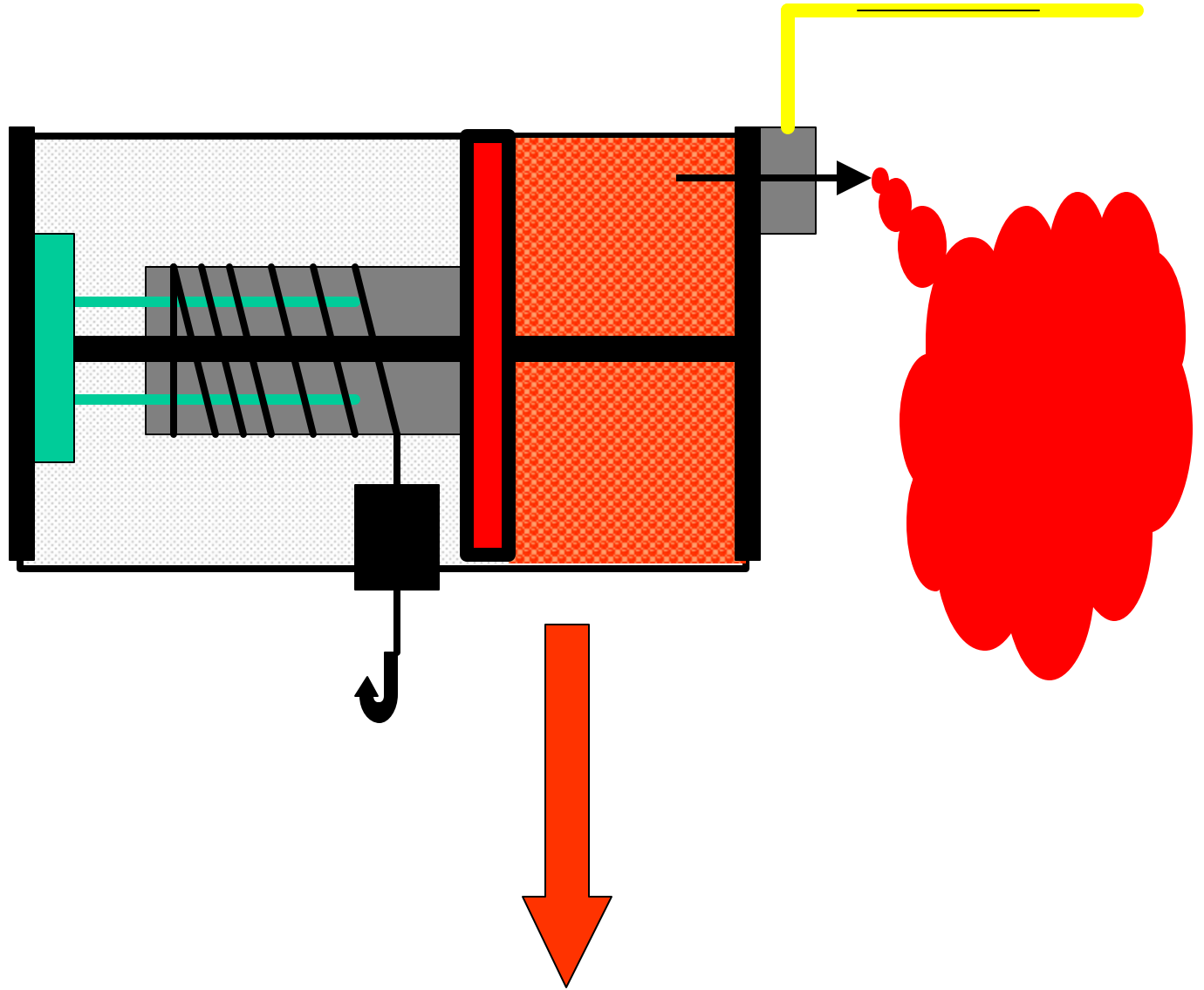
Main Air Supply



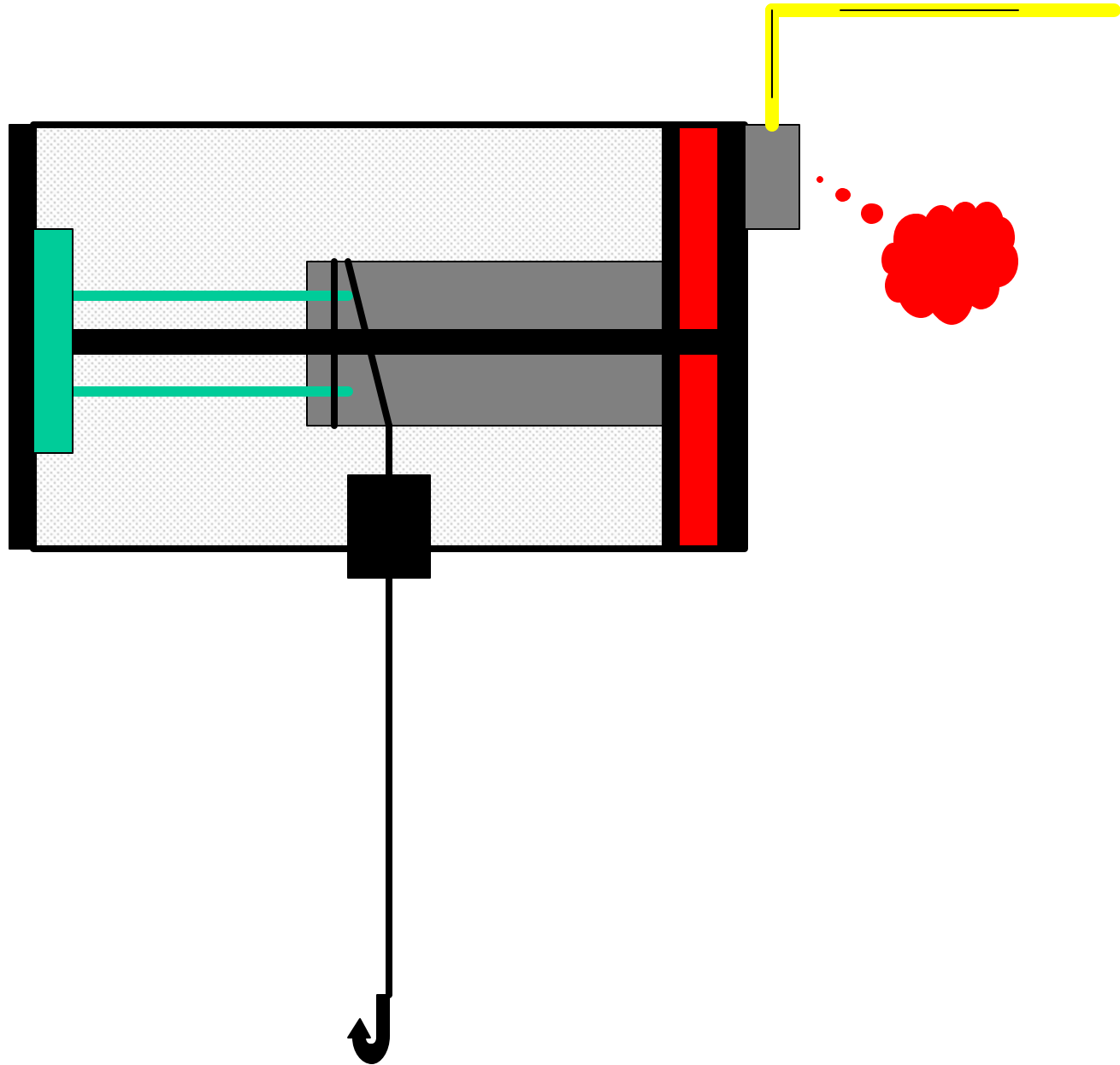
Main Air Supply



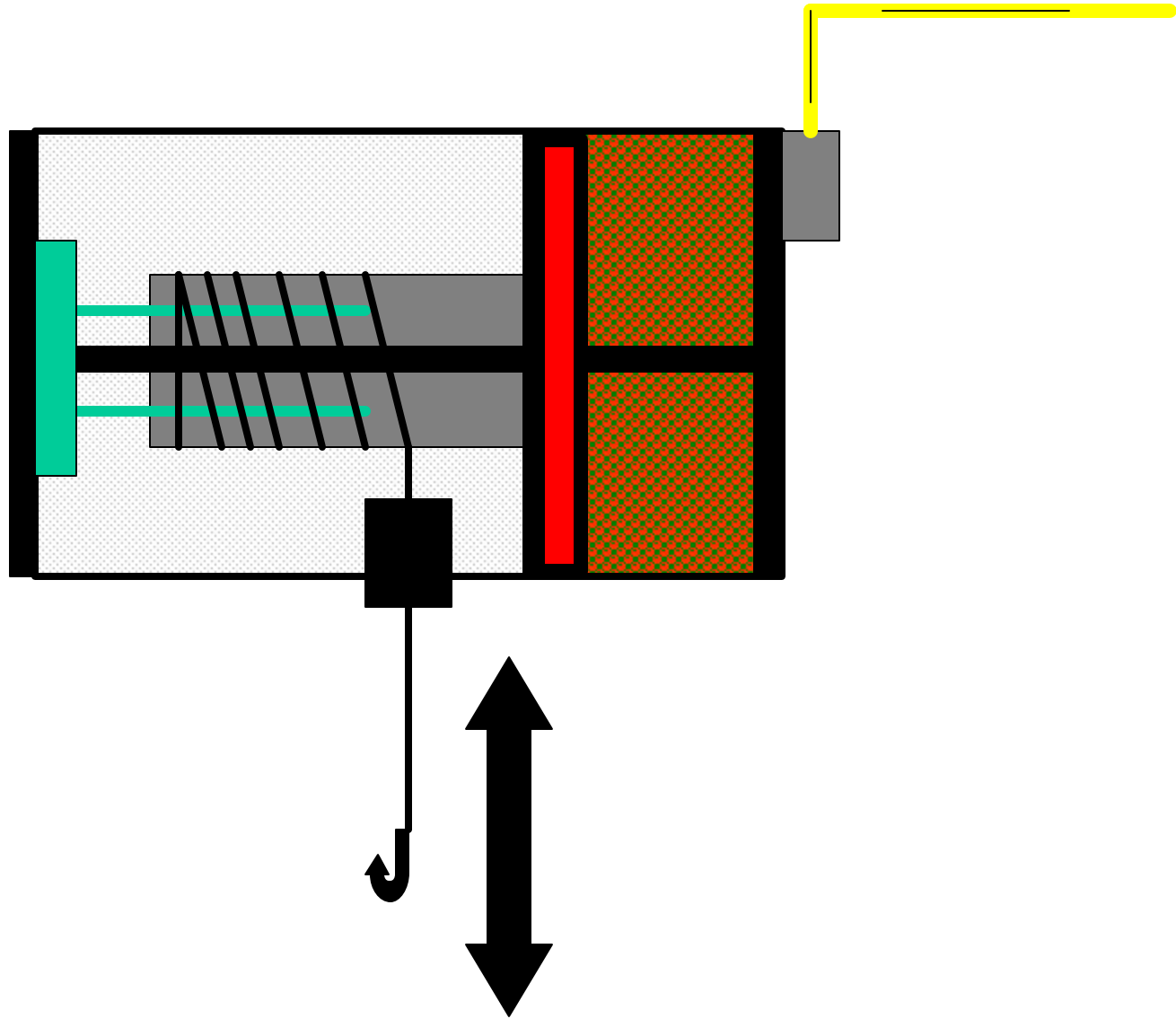
Main Air Supply



Main Air Supply



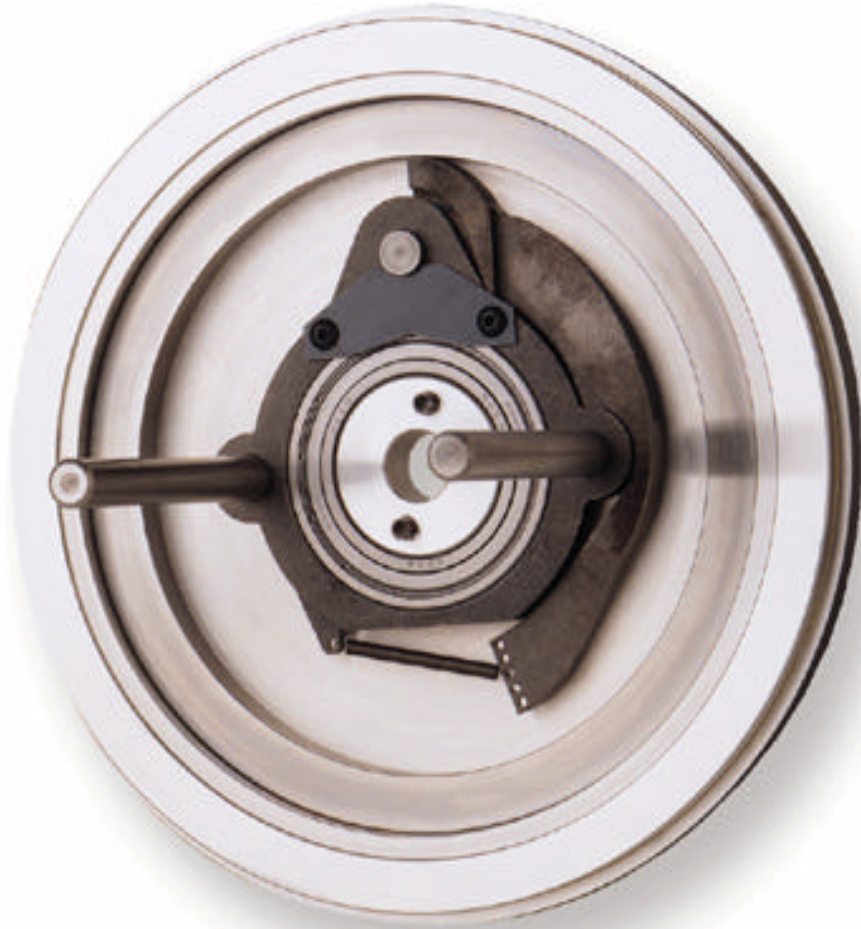
Main Air Supply



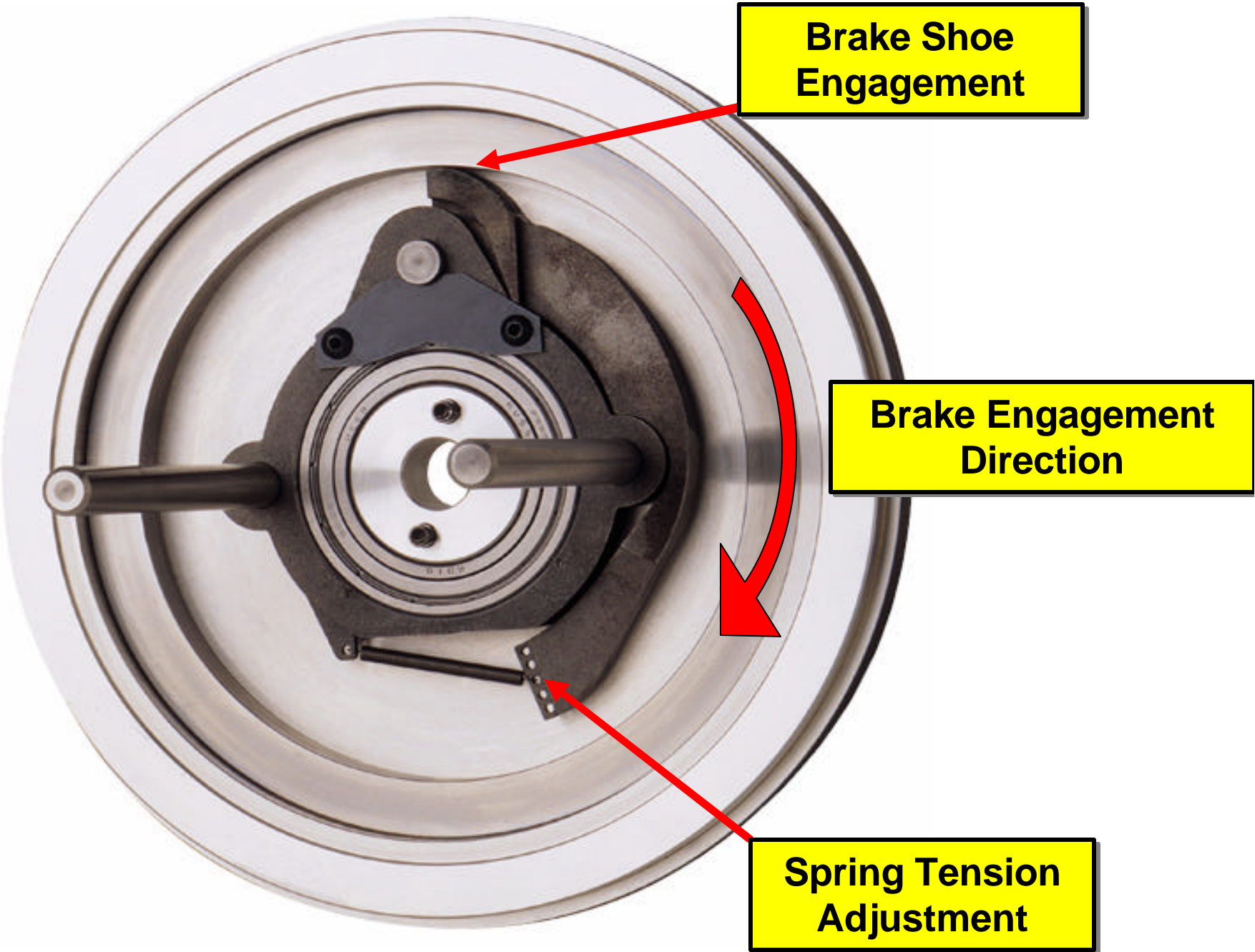
Balancer Preventive Maintenance

- **Clean and lubricate piston, ball screw and ball nut annually**
- **Refer to Balancer Service Manual form MHD 56151**

Z-Brake



- **Safety Retraction System**
- **Centrifugal Force**
- **Prevents Excessive Upward Acceleration**
- **Standard On All Units Except 50 lb. Tool Balancer**
- **Patent No. 5,522,581**

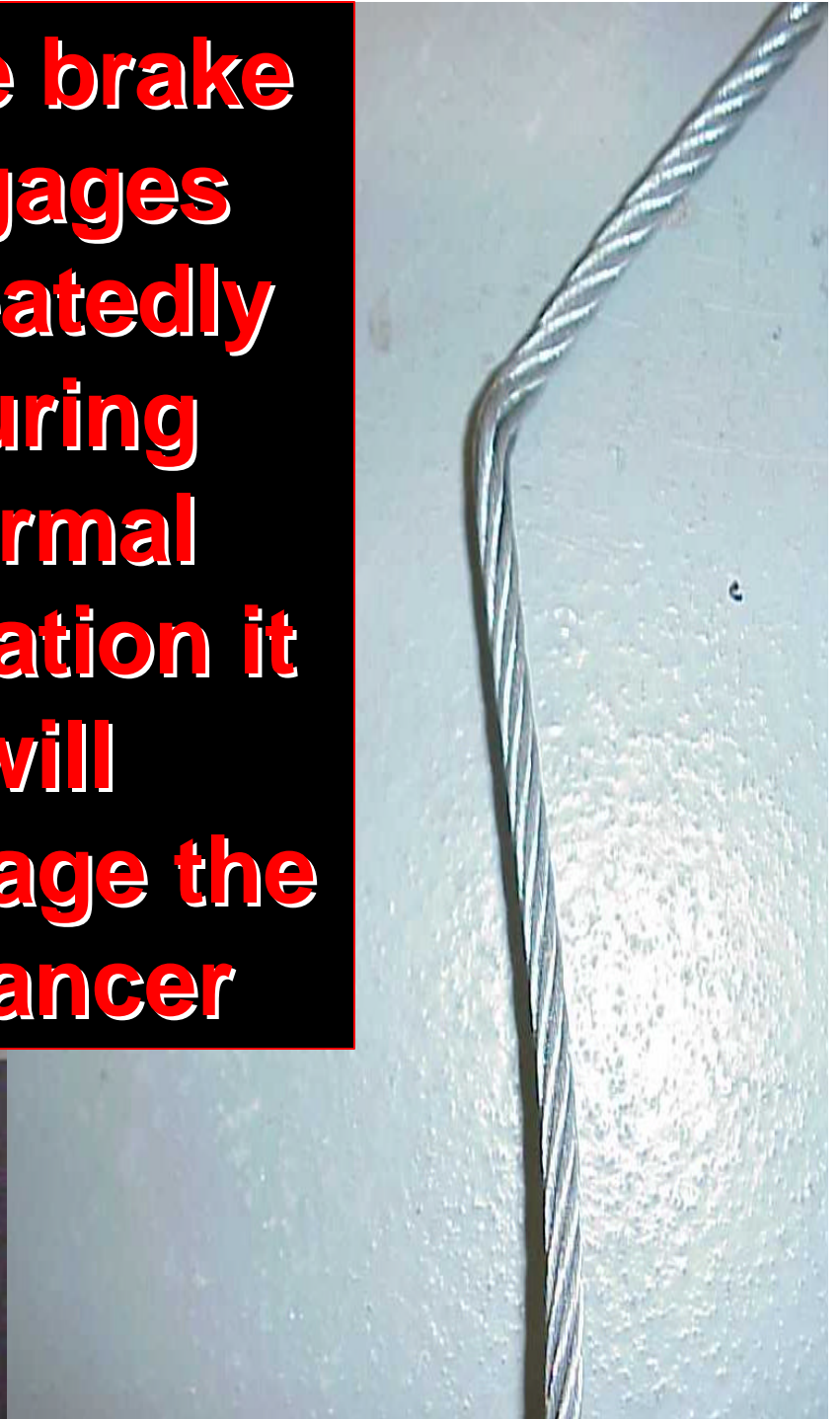


**Brake Shoe
Engagement**

**Brake Engagement
Direction**

**Spring Tension
Adjustment**

**If the brake
engages
repeatedly
during
normal
operation it
will
damage the
balancer**



Z-Brake Preventive Maintenance

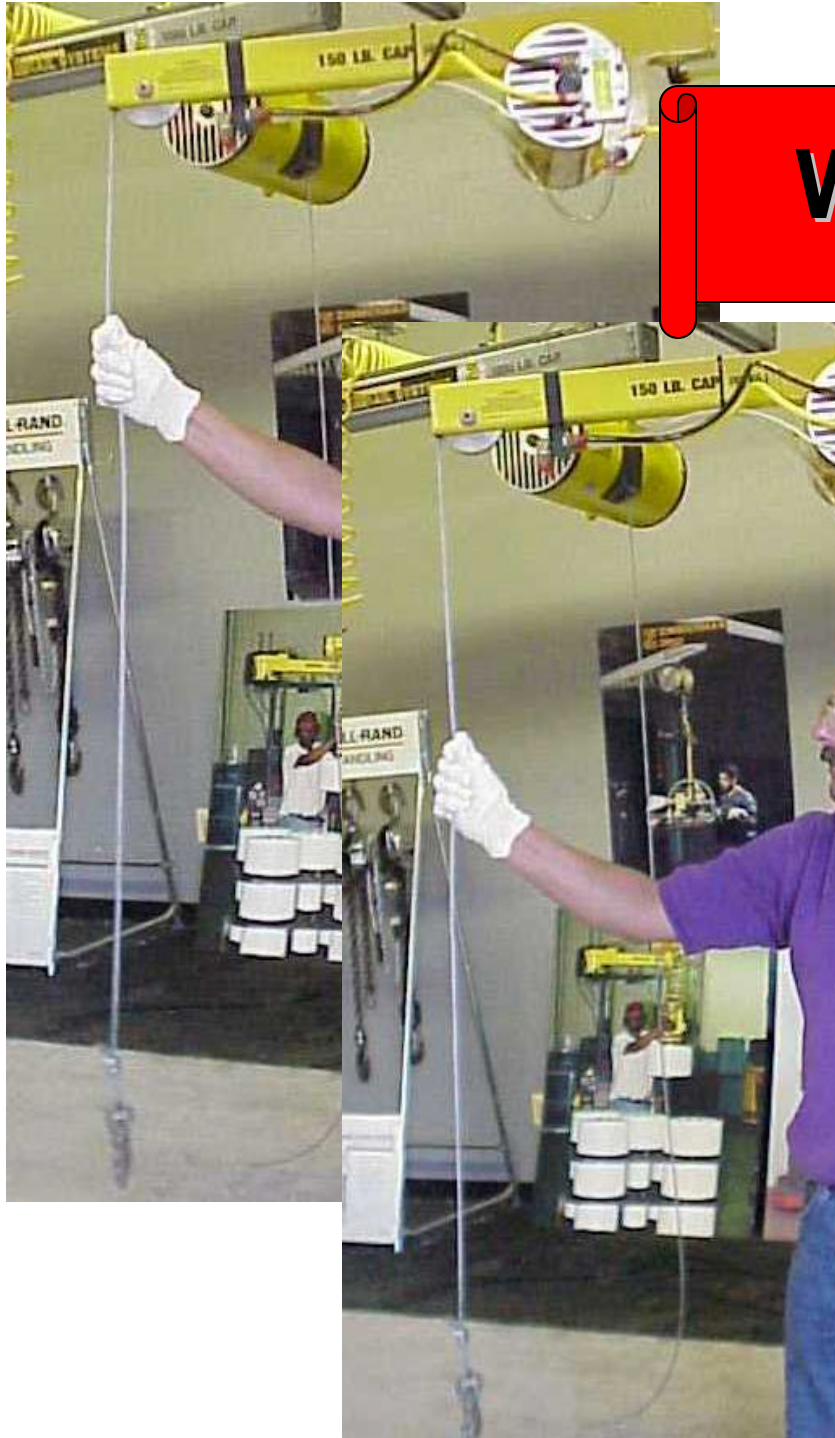
- **Required annually**
- **Check for engagement**
- **Check condition**

Wire Rope

- **1400 lb. Working Capacity**
- **250,000 Cycles**

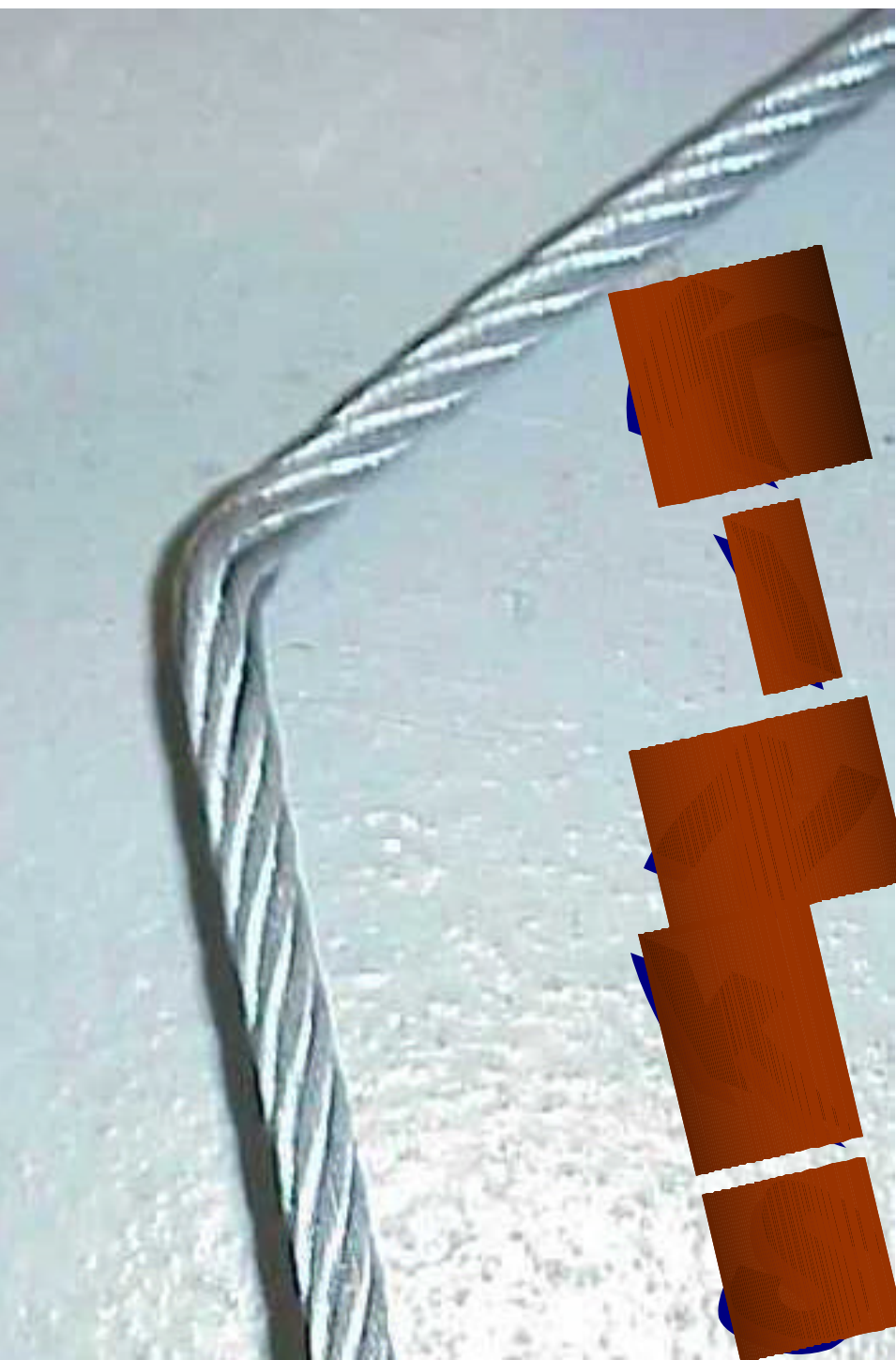


Wire Rope Inspection

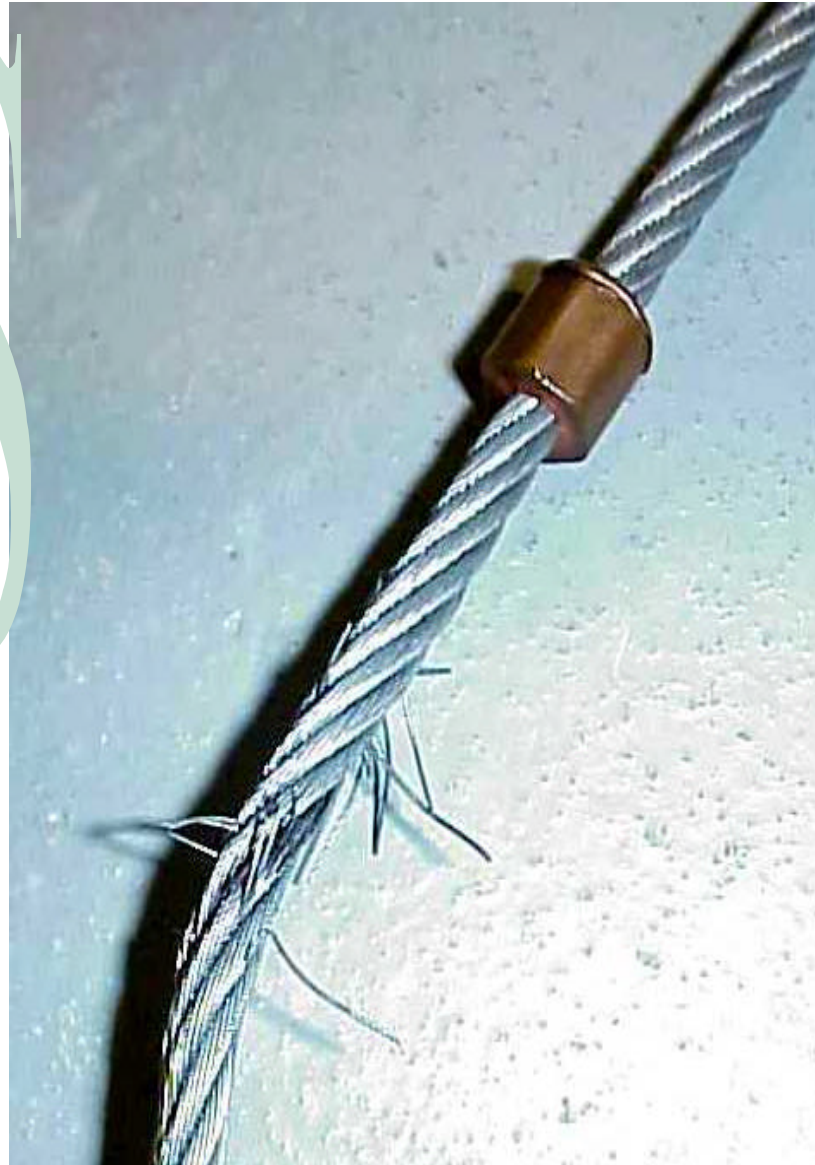


- Perform daily
- Use a glove
- Check entire length
- Replace when frayed

УТОУ МЗОО



FRAYS



**Of the wire rope occur
with normal wear**

Load Hooks

Crosby/ Bullard

Golden Gate®

Lift Lok®

Working limit 1/2 ton

Ultimate load= 2 tons



Top bail swivels

Load Hook Inspection

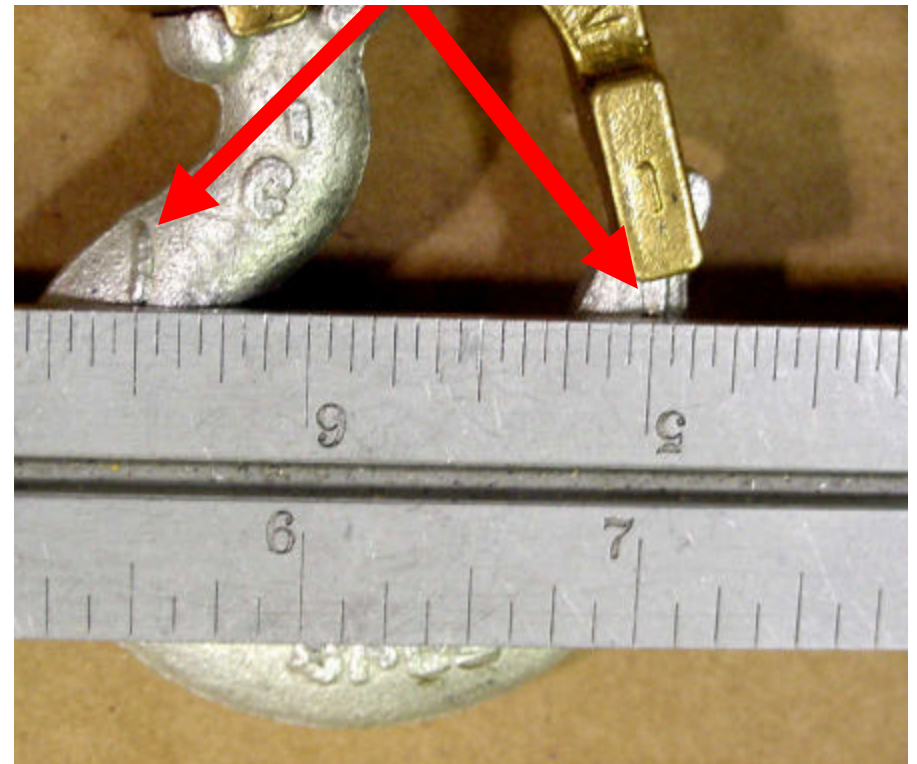
Quic-Check®

align @ 1-1/2 inch



Self Closing Gate

Tip of hook aligns



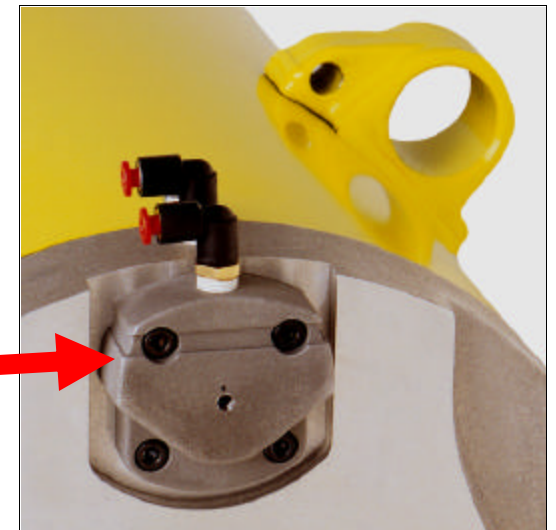
Z-Stop- Option

Engagement Plate

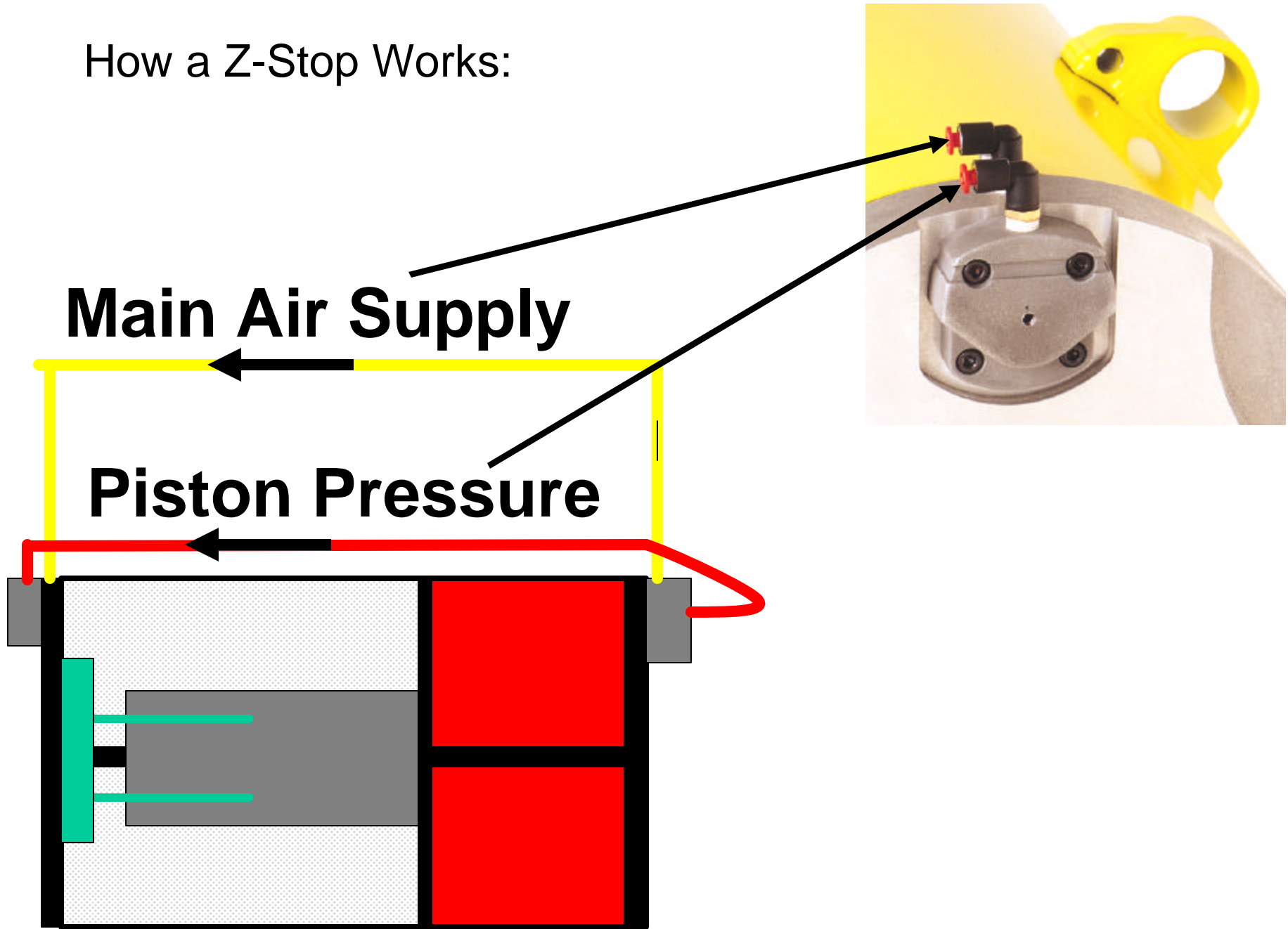
Engagement Pin

Engagement Pin

Housing



How a Z-Stop Works:

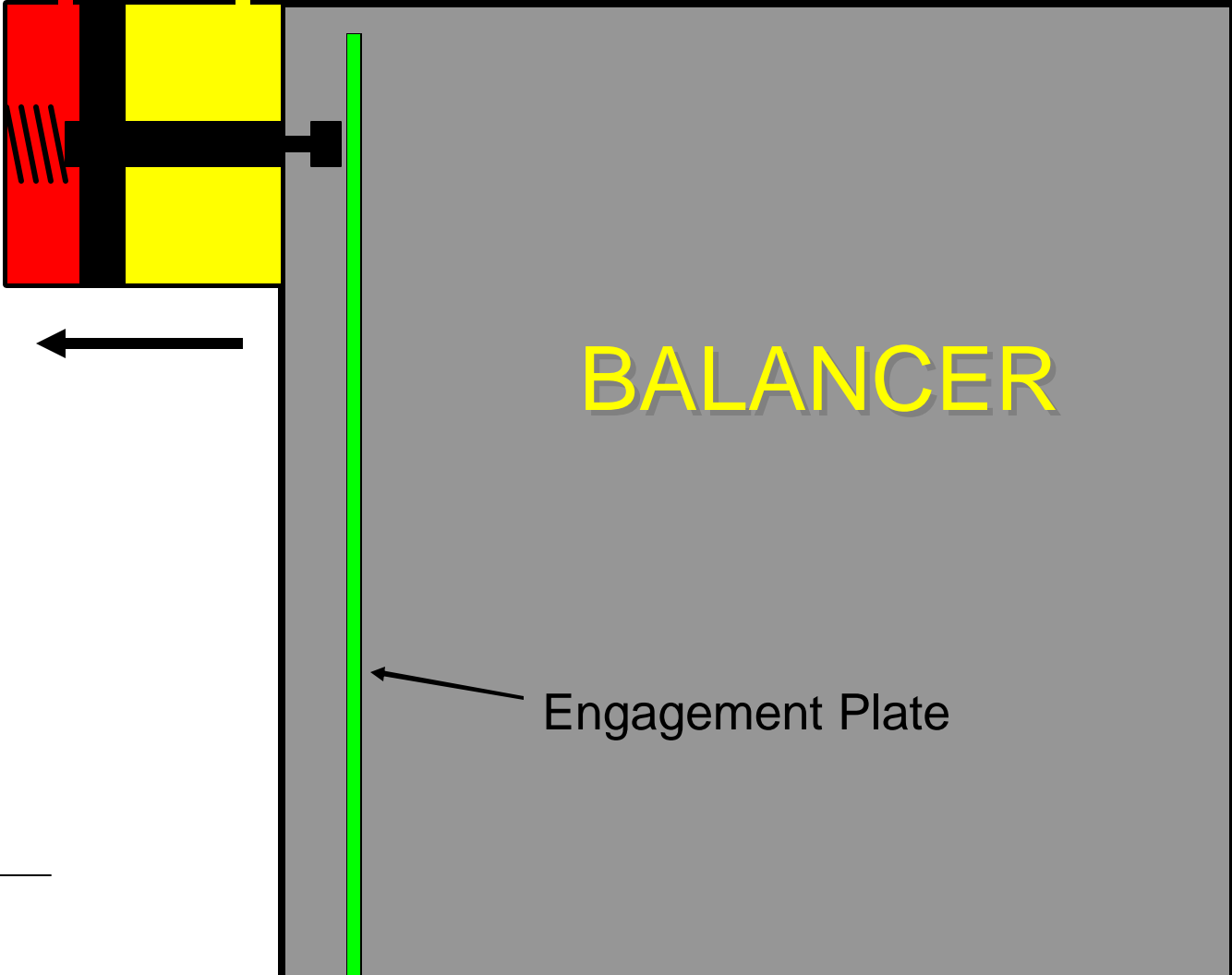


Patent No. 5,522,581 & 5,848,781

How a Z-Stop Works:

Main Air Supply

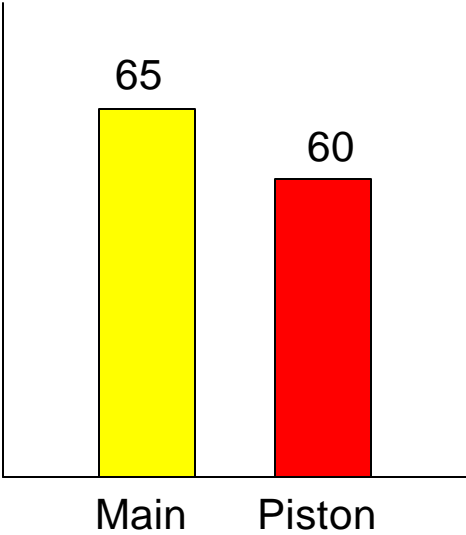
Piston Pressure



BALANCER

Engagement Plate

PSI

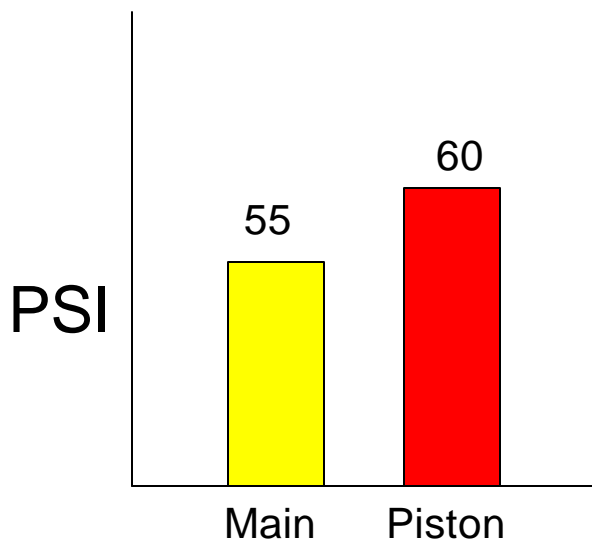
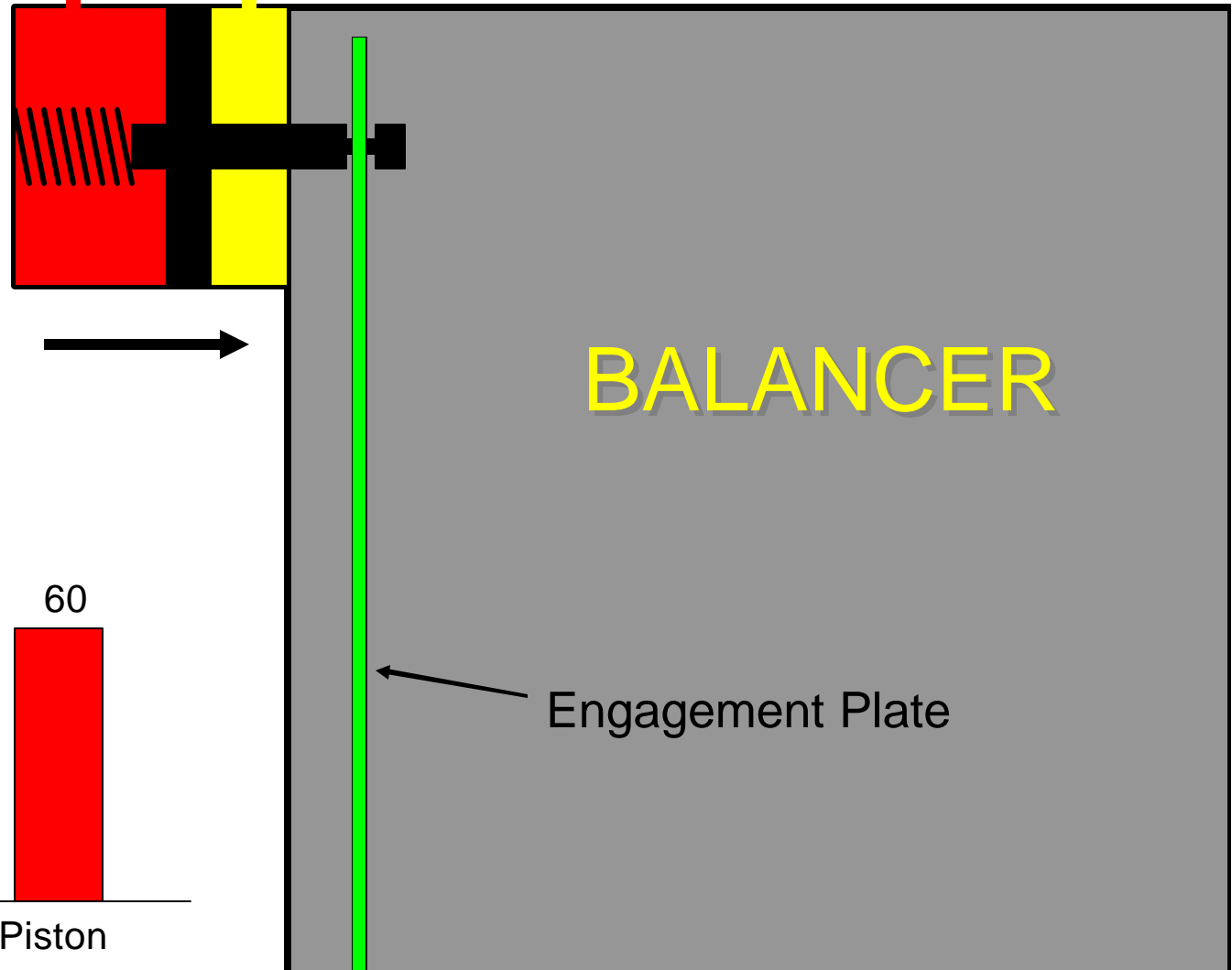


How a Z-Stop Works:

Main Air Supply

When Main Air Supply Pressure Falls Below Piston Pressure The Pin Shifts and Engages the Plate, locking out the rotation of the reel.

Piston Pressure



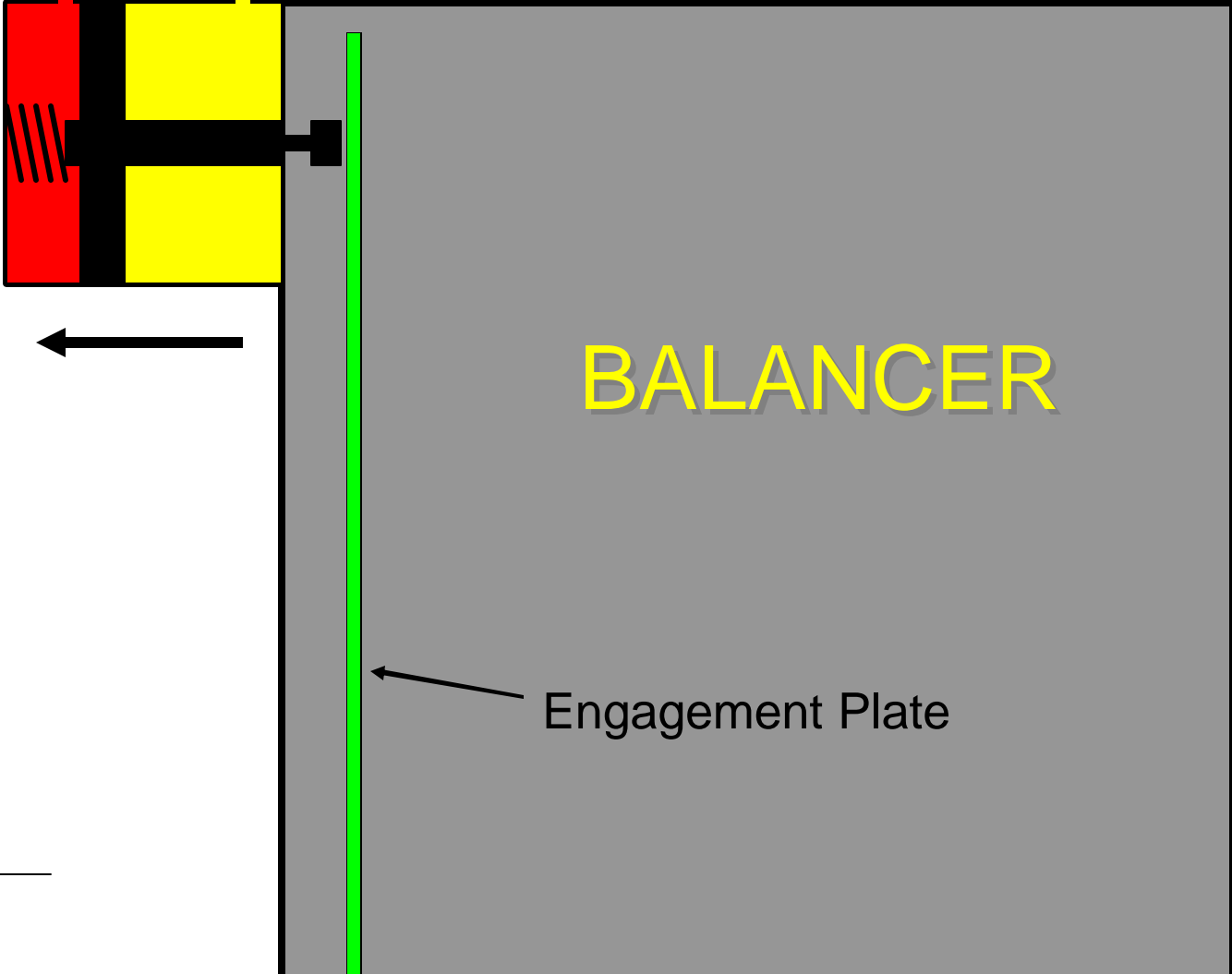
BALANCER

Engagement Plate

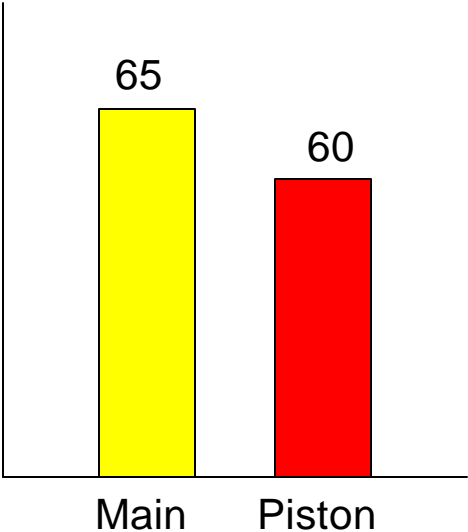
How a Z-Stop Works:

Main Air Supply

Piston Pressure



PSI



BALANCER

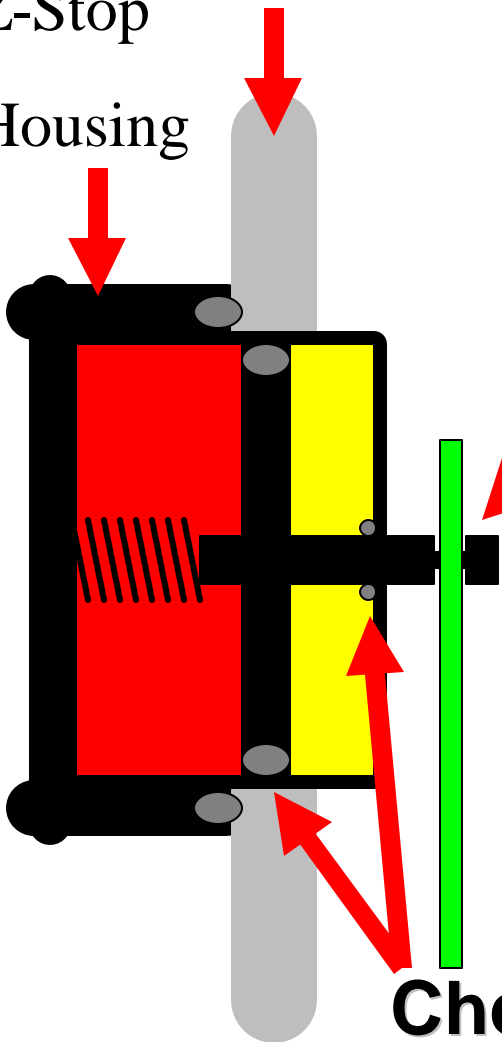
Engagement Plate

Z-Stop Inspection

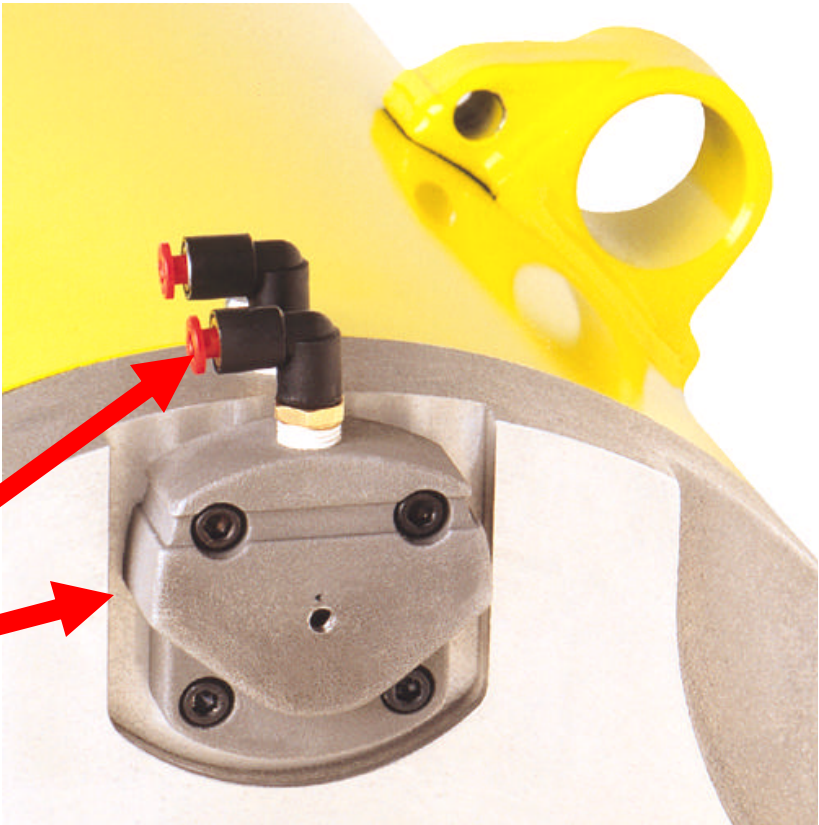
Z-Stop
Housing

End Cover

Check engagement



Check leakage



EXERCISE 2

Maintenance

Inspections

Z-Brake / Z-Stop

CONTROLS FUNCTION

- **ZA- ZIM AIR**
- **BA- BALANCE AIR**
- **EA- EQUALIZED AIR**

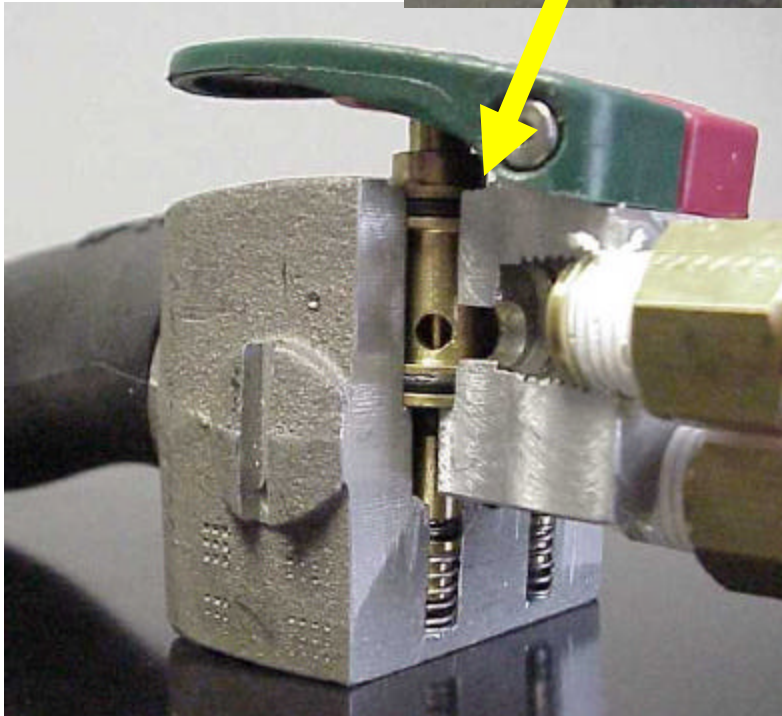
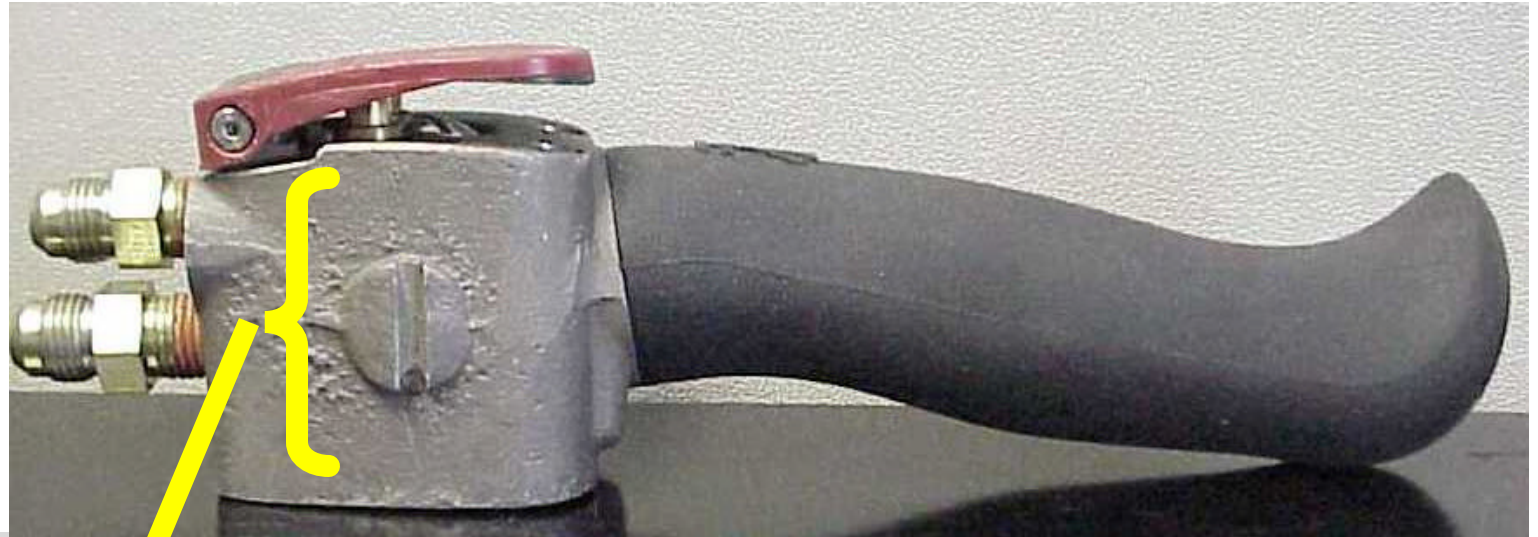
CONTROL	DESCRIPTION	APPLICATION	LIMITATIONS
<i>BA Basic</i>	Pressure regulator control	Balancing of a single load that will not be removed as part of the customer's process- Weld Guns Multi-spindle Nut Runners Checking Fixtures	Supplied only on the 50 and 150lb. capacity Balancers
<i>BA Z-Servo</i>	Pressure regulator control with input amplifying servo	Balancing of a single load that will not be removed as part of the customer's process- Weld Guns Multi-spindle Nut Runners Checking Fixtures	Supplied with 200-500lb.capacity balancers Above 600lbs. total load the control will lose the ergonomic effect
<i>EA Basic</i>	Pressure regulator control with adjustment for multiple loads Pendent actuated	Balancing of three loads within a range. Three mode pendent: HI-LOAD LO-LOAD UN-LOAD	The variation between UN-LOAD and HI-LOAD can be a maximum of 45 lbs.
<i>EA 2PS</i>	Pressure regulator control with adjustment for empty device and loaded device Integrated to device or manually actuated	Balancing control integrated into a handling device that will pick up only one size or weight part	If the total load is above 200lbs. the control will lose the ergonomic effect
<i>ZA Basic</i>	Manifold control with speed adjustments; capable of lifting up to operating capacity of balancer Pendent actuated	All lifting applications	80% of operating capacity overall speed will begin to decrease

ZA- Pendent Control



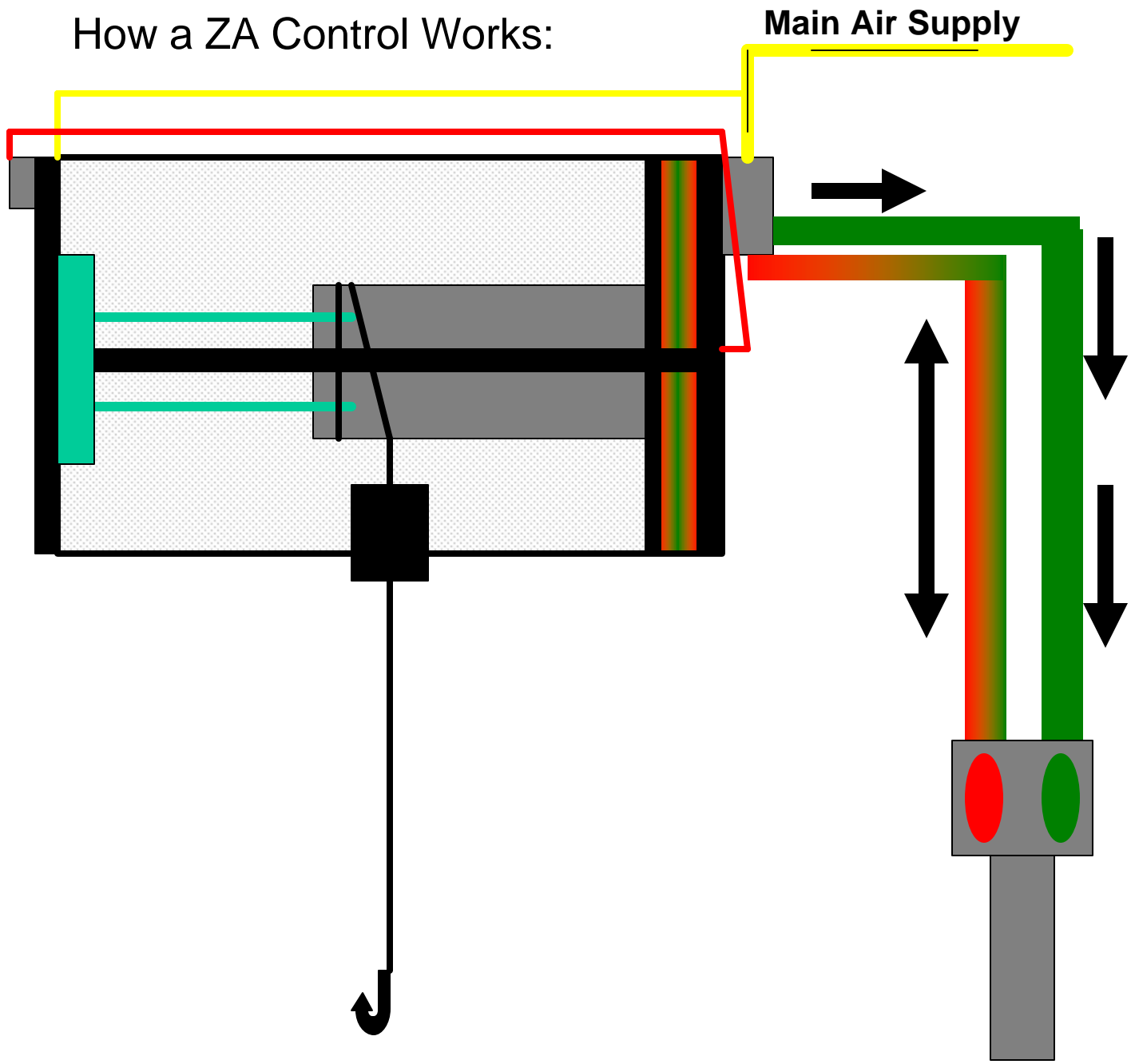
- “Hoisting” Applications
- Ergonomic Pendant
- Adjustable Speed
- Smooth Shock Free Lifting

ZA PENDENT

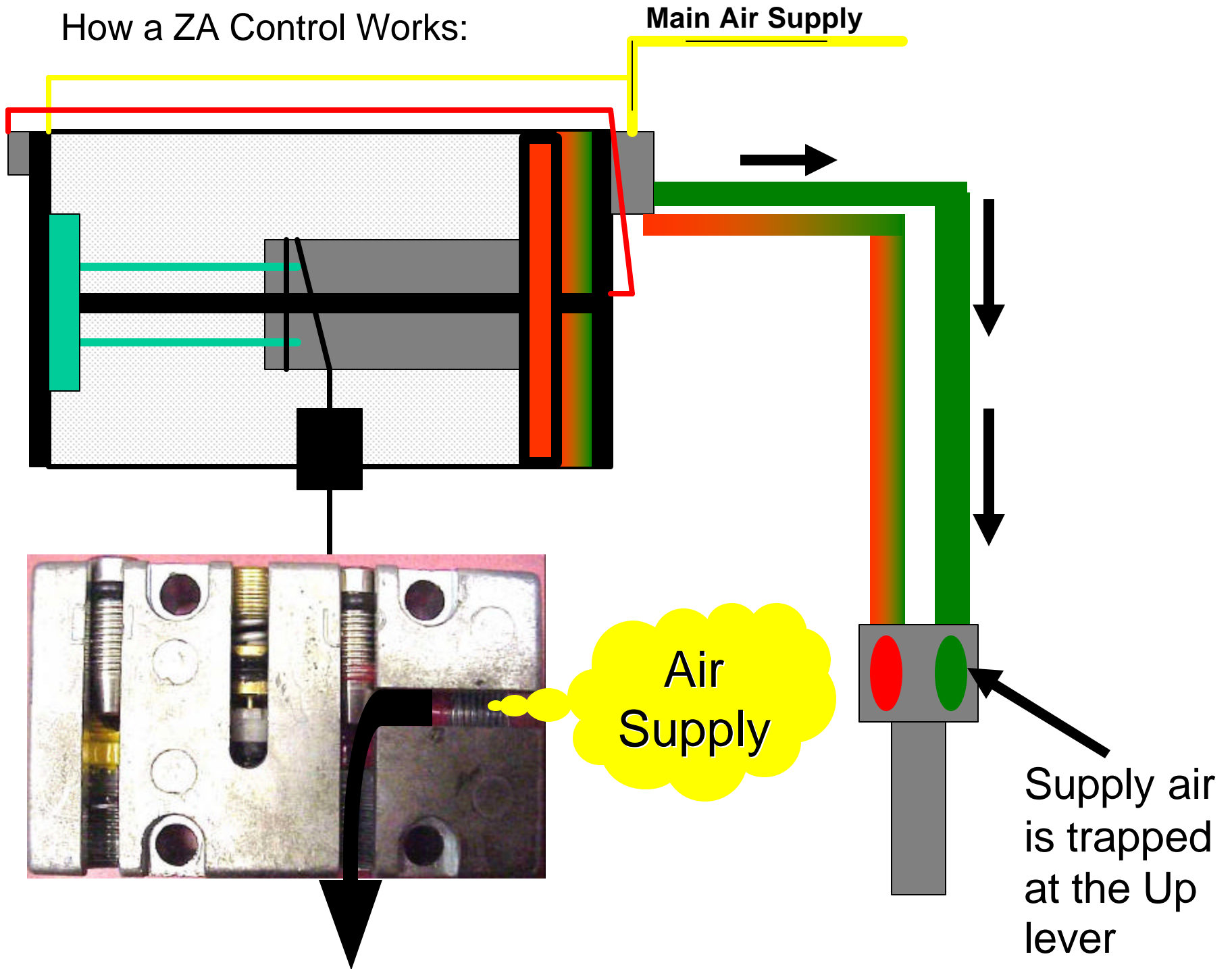


- Operates like an accelerator
- Versatile speed control
- Lightweight aluminum construction

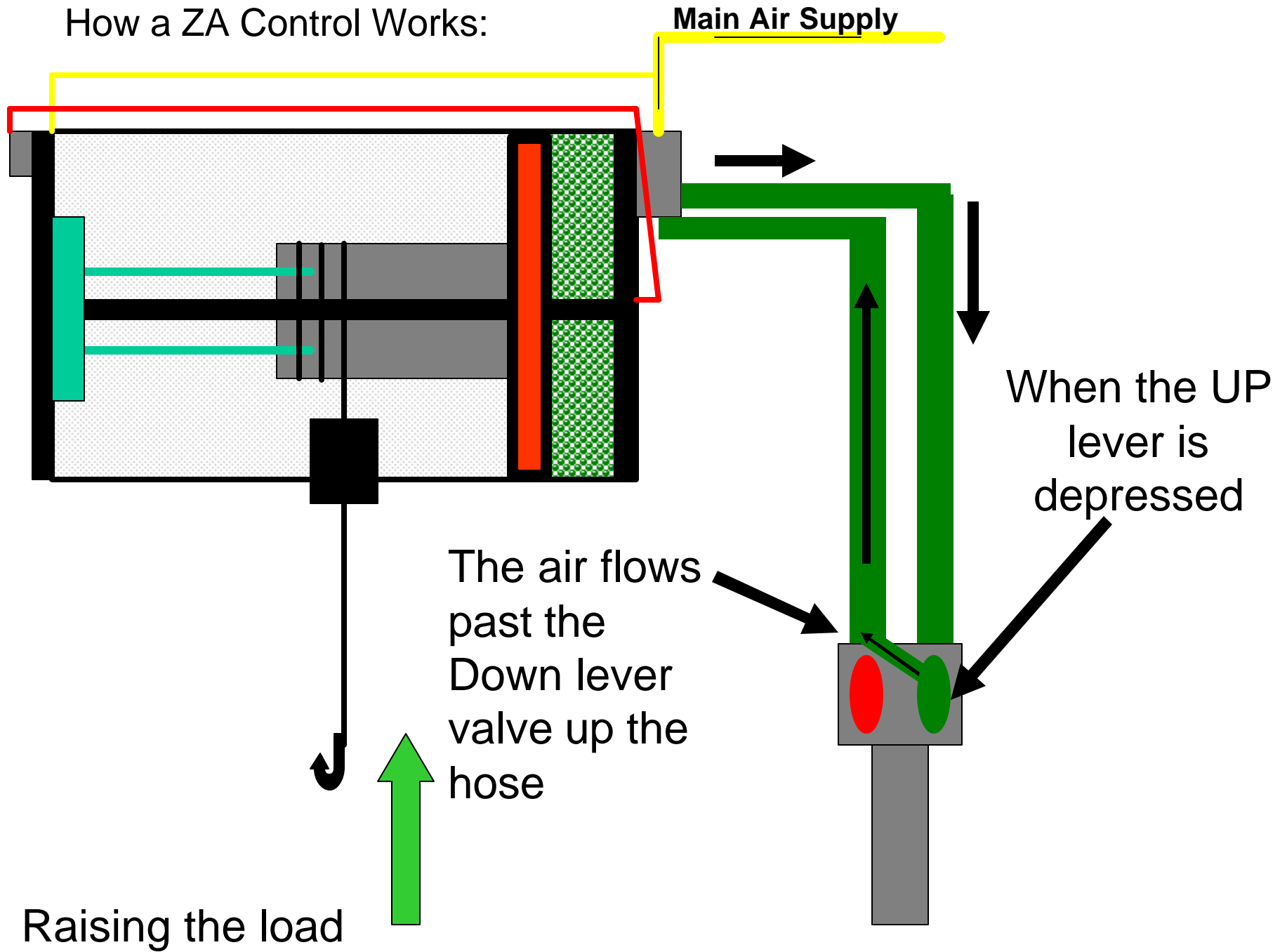
How a ZA Control Works:



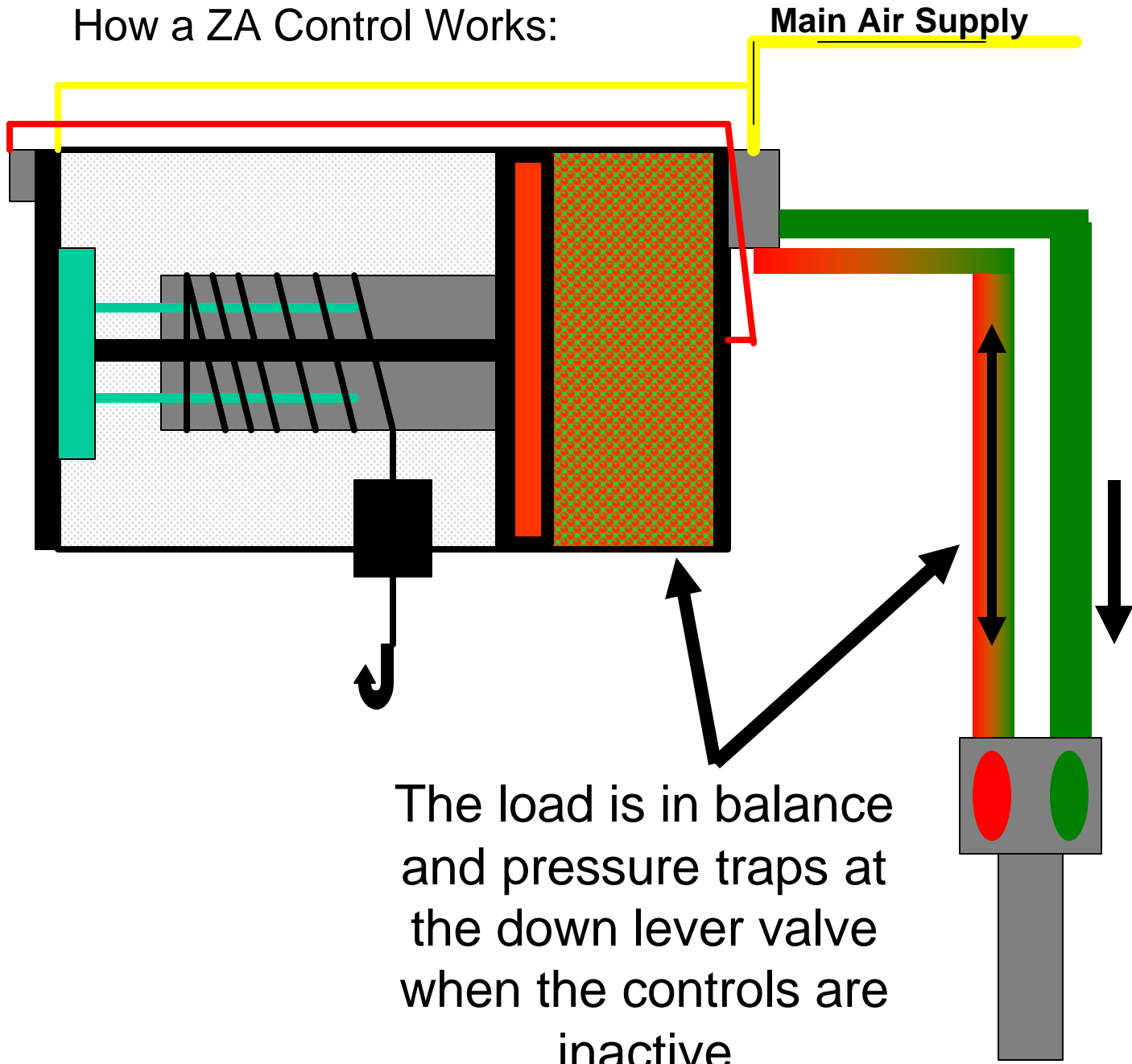
How a ZA Control Works:



How a ZA Control Works:

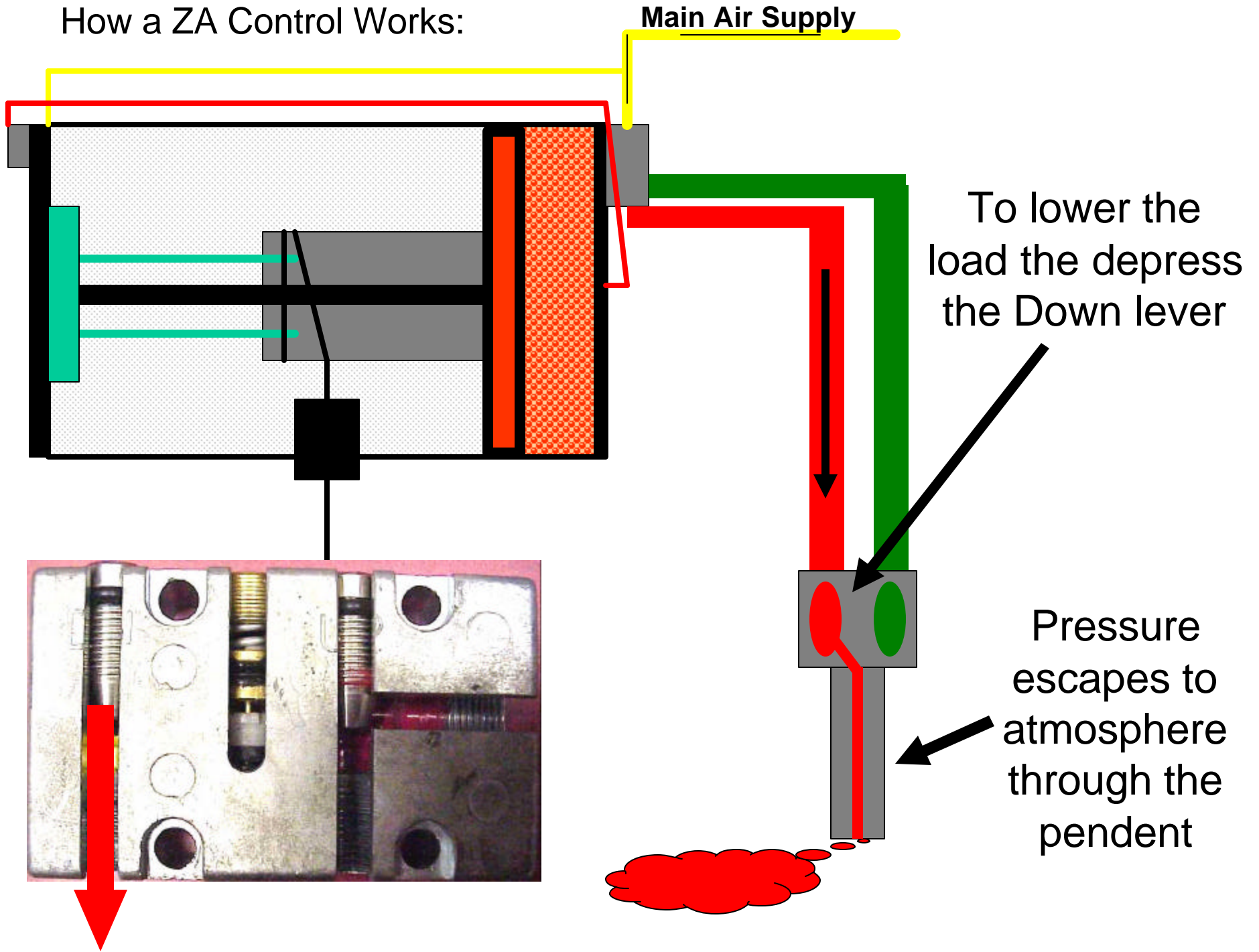


How a ZA Control Works:



The load is in balance and pressure traps at the down lever valve when the controls are inactive

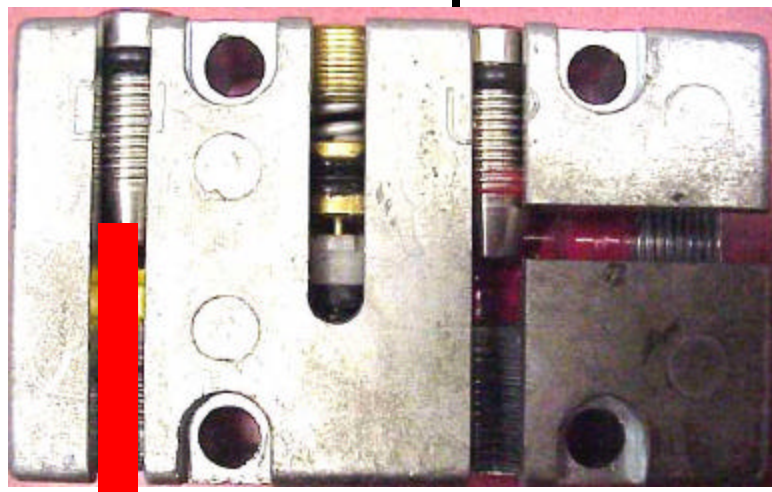
How a ZA Control Works:



Main Air Supply

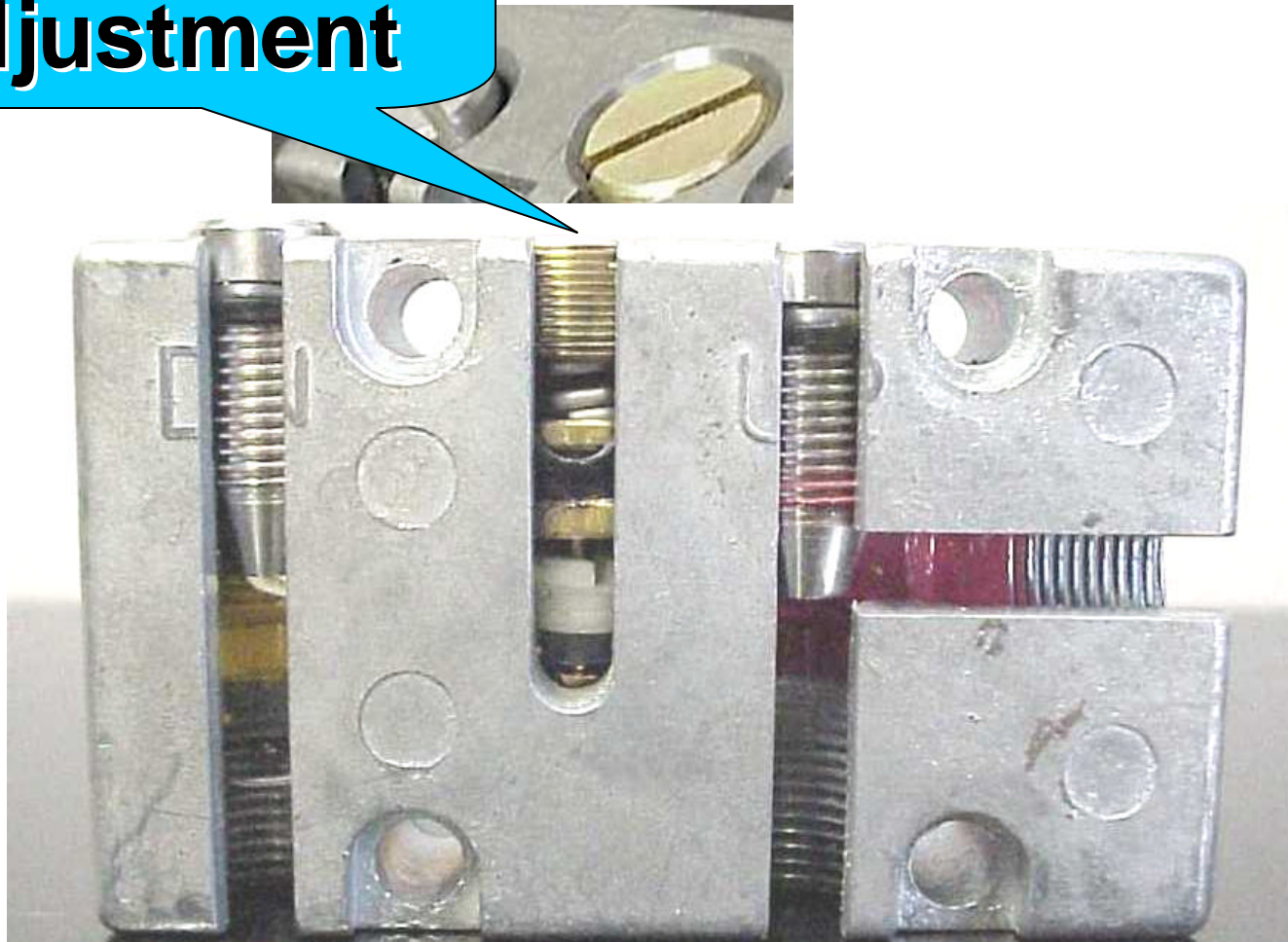
To lower the load the depress the Down lever

Pressure escapes to atmosphere through the pendent



- Normal Setting Flush to Top
- Compensates for leakage

Hook Balance Adjustment

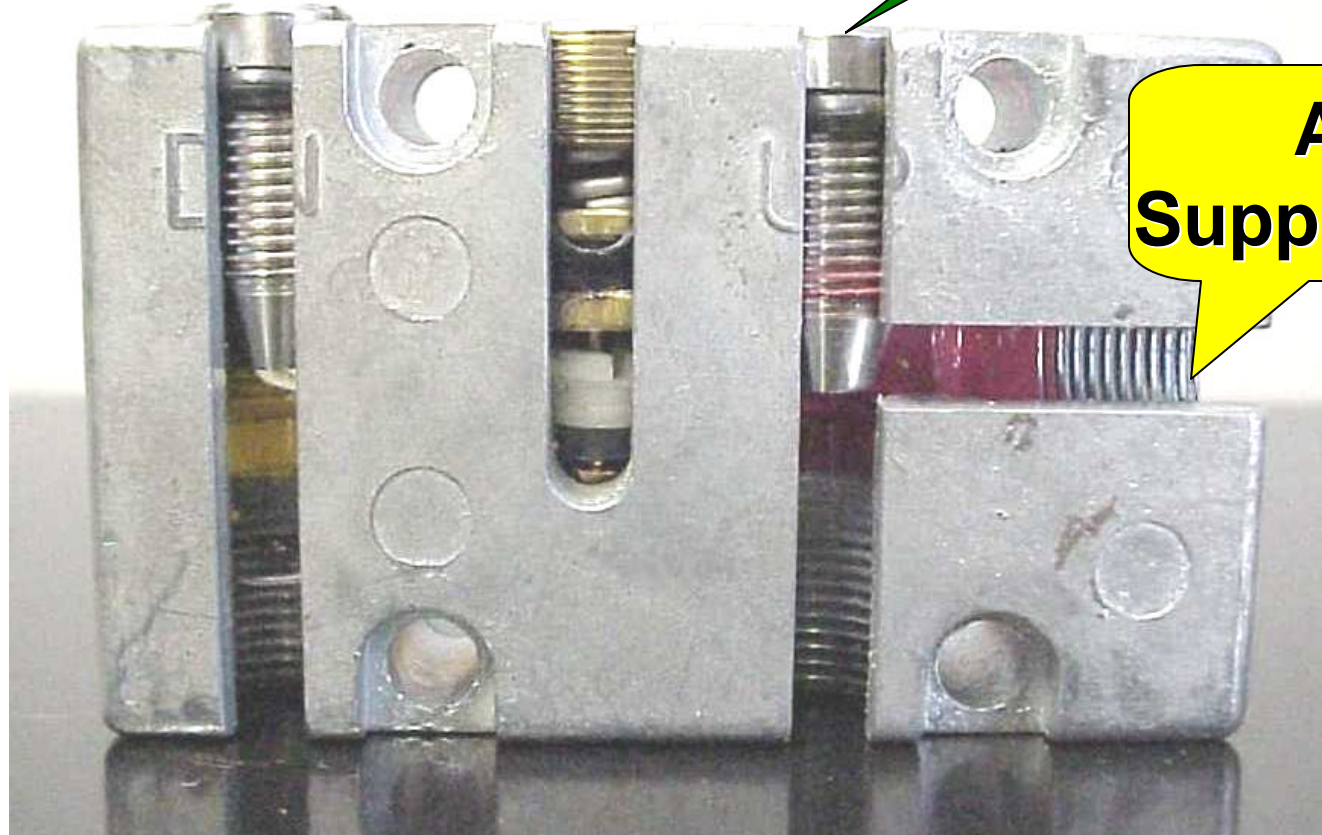


ZA MANIFOLD

**Down
Speed Control**



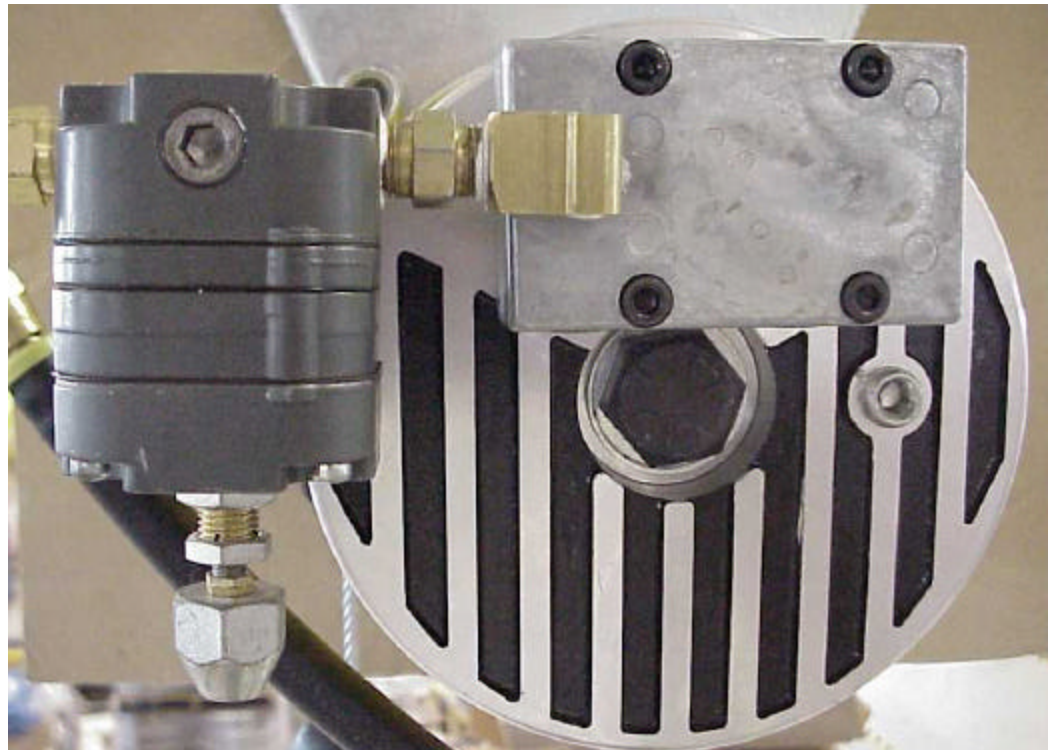
**Up
Speed Control**



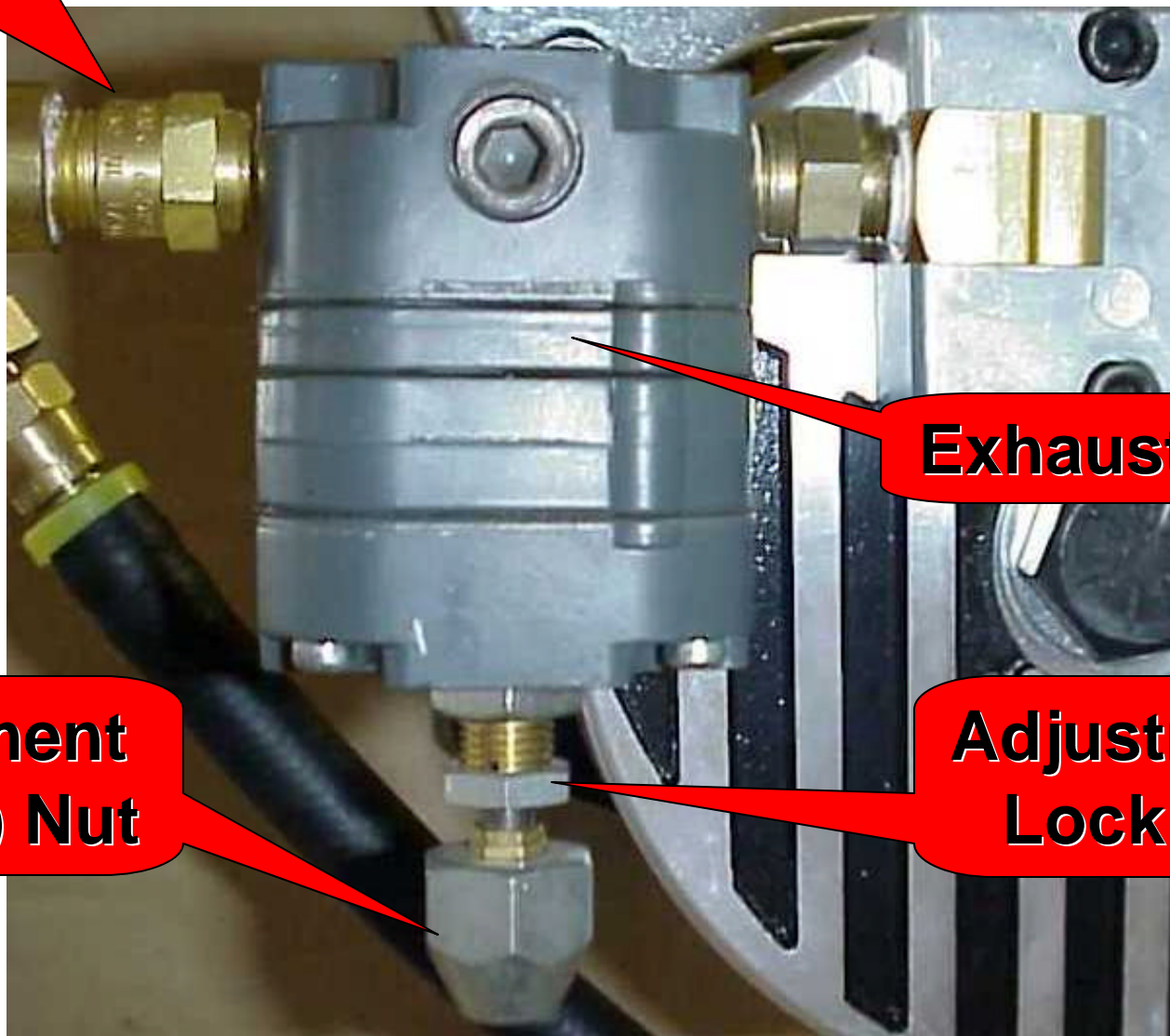
**Air
Supply Inlet**

BA- Balance Control

- 50 lb. and 150 lb. Balancers
- BA Control
- Versatility
- Virtually Maintenance Free
- 60 and 80 inch Travel



Check valve



Exhaust Ports

**Adjustment
(Acorn) Nut**

**Adjustment
Lock Nut**

EA Balance Controls



BA Z-Servo

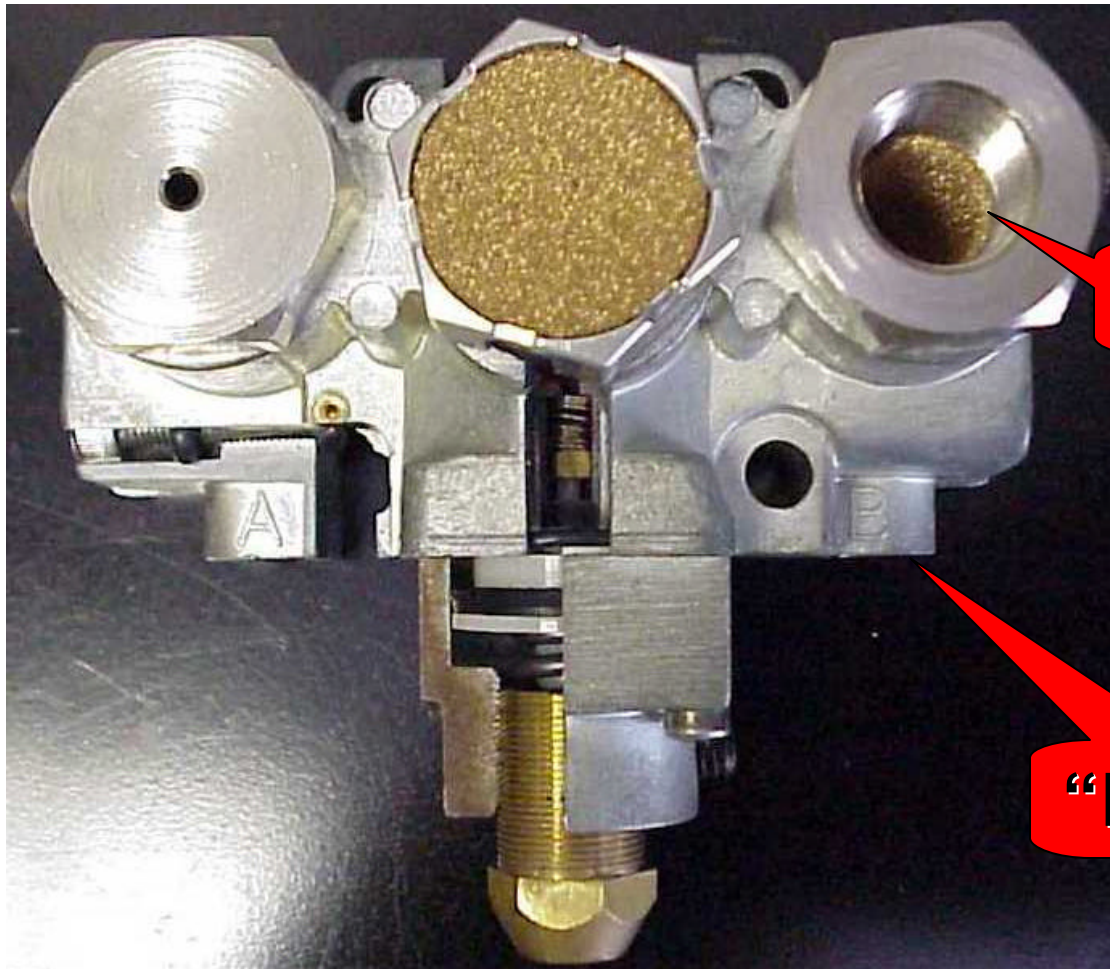


EA 2PS Control



EA Basic

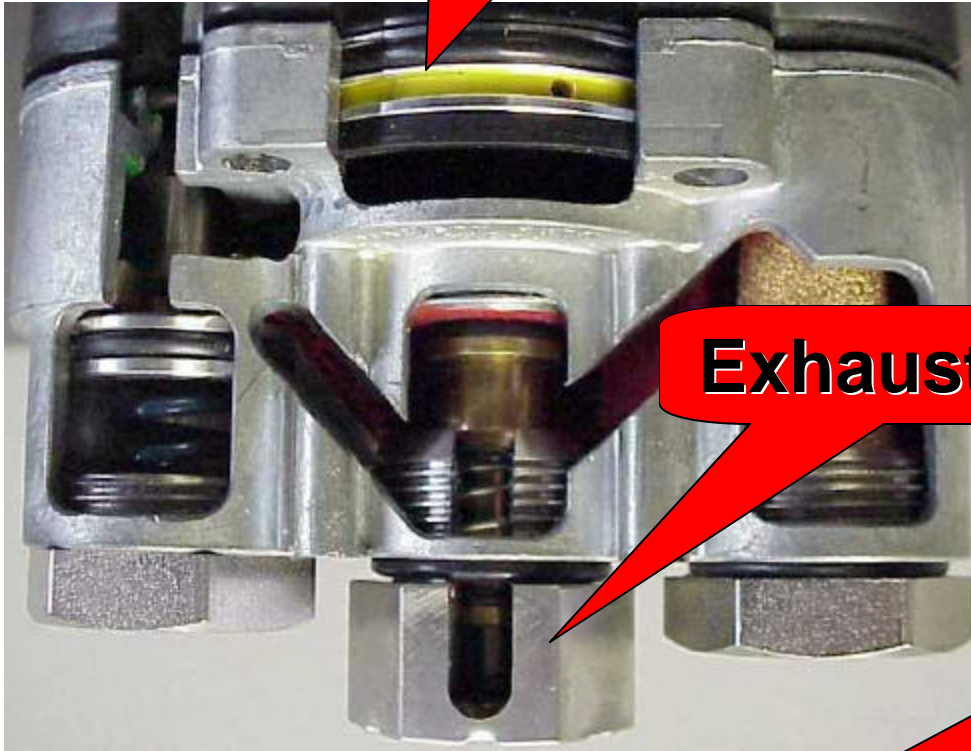
EA Regulator



Inlet Port

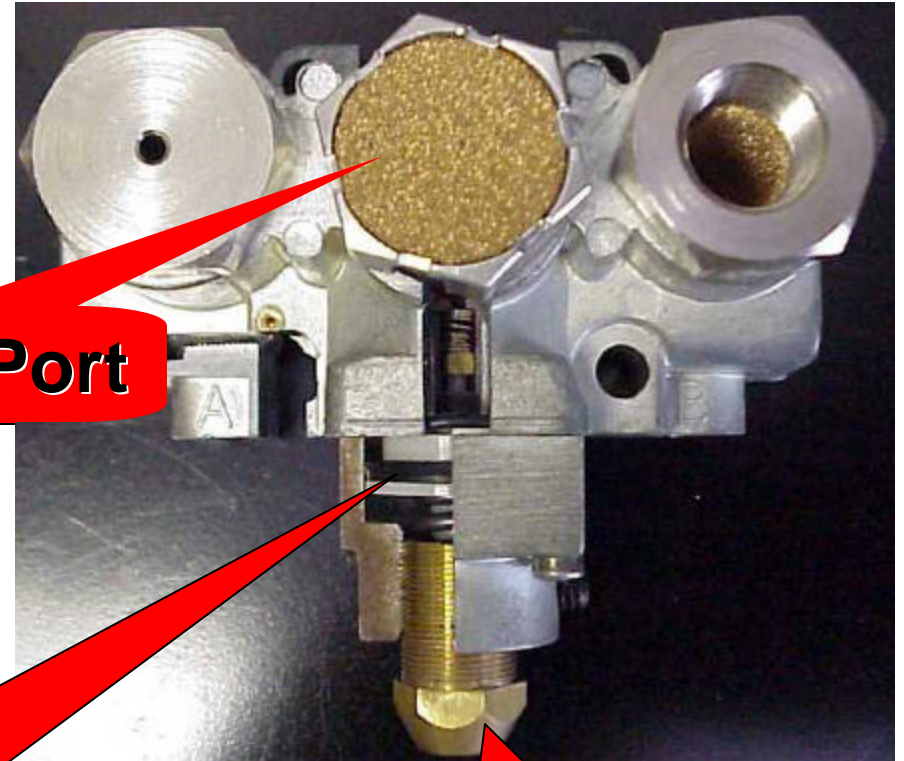
“B” Port

Main Regulator



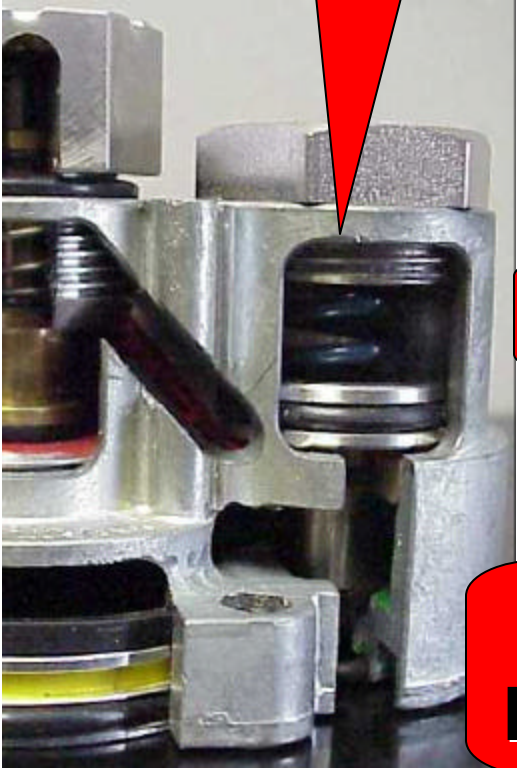
Exhaust Port

Control Regulator

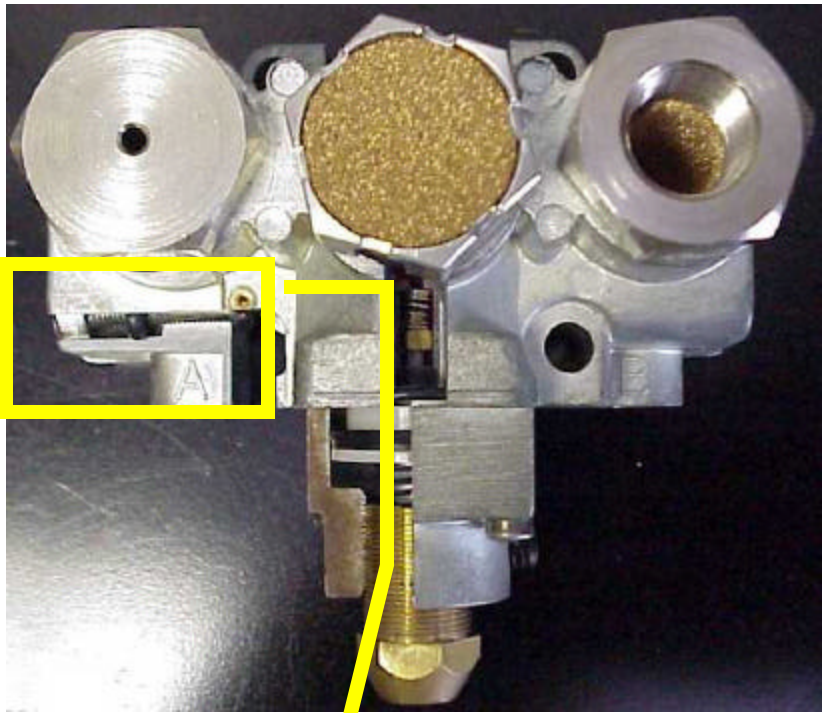


**Adjustment
(Acorn) Nut**

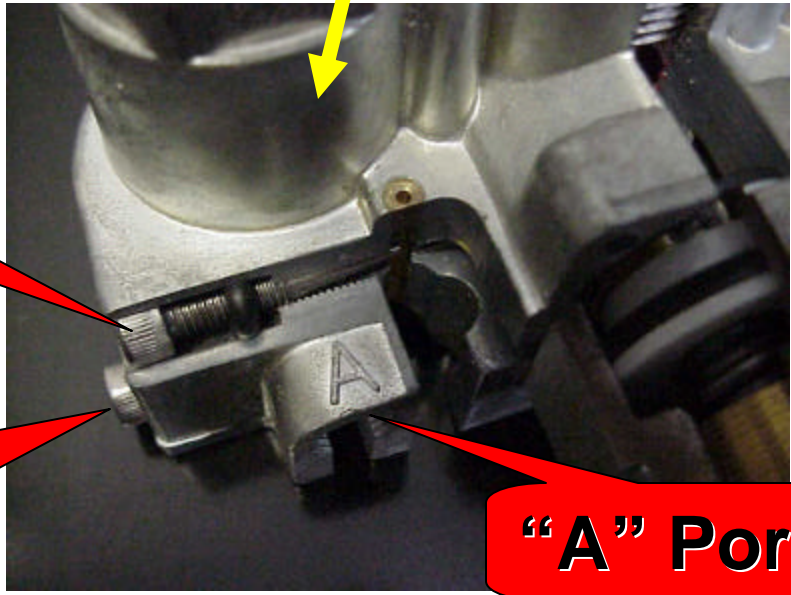
Check Valve



Trim Valve



Auxiliary Flow Valve



"A" Port

EXERCISE 3

ZA CONTROL

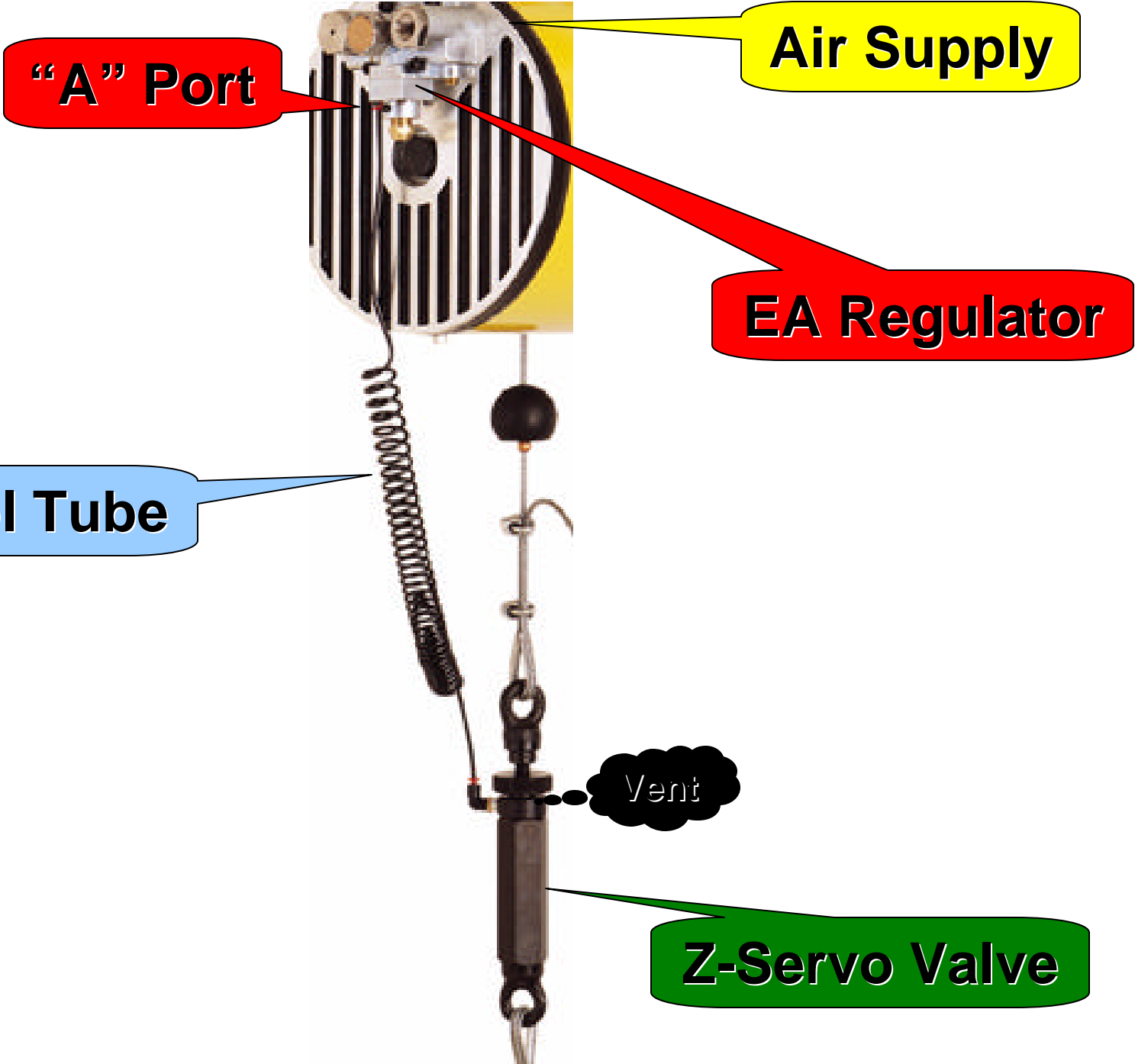
BA-BALANCE AIR

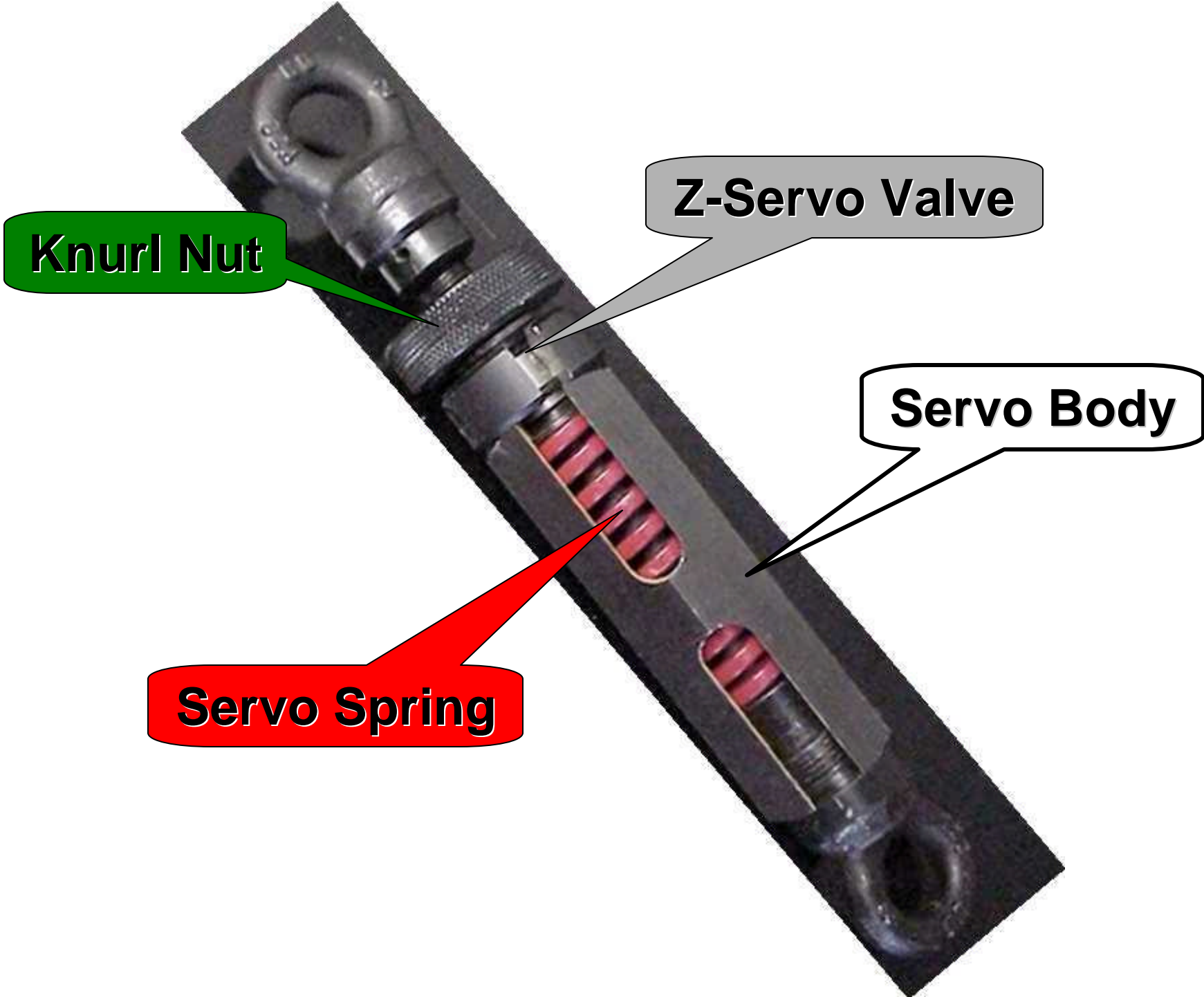
EA-EQUI-AIR REGULATOR

BA Z-Servo Control



- 200, 350 & 500 lb. Balancers
- Amplifies Operator Input
- 3% - 5% of Load
- Ideal For:
 - Tool Balancing
 - Weld Gun Suspension
 - Fixture Suspension



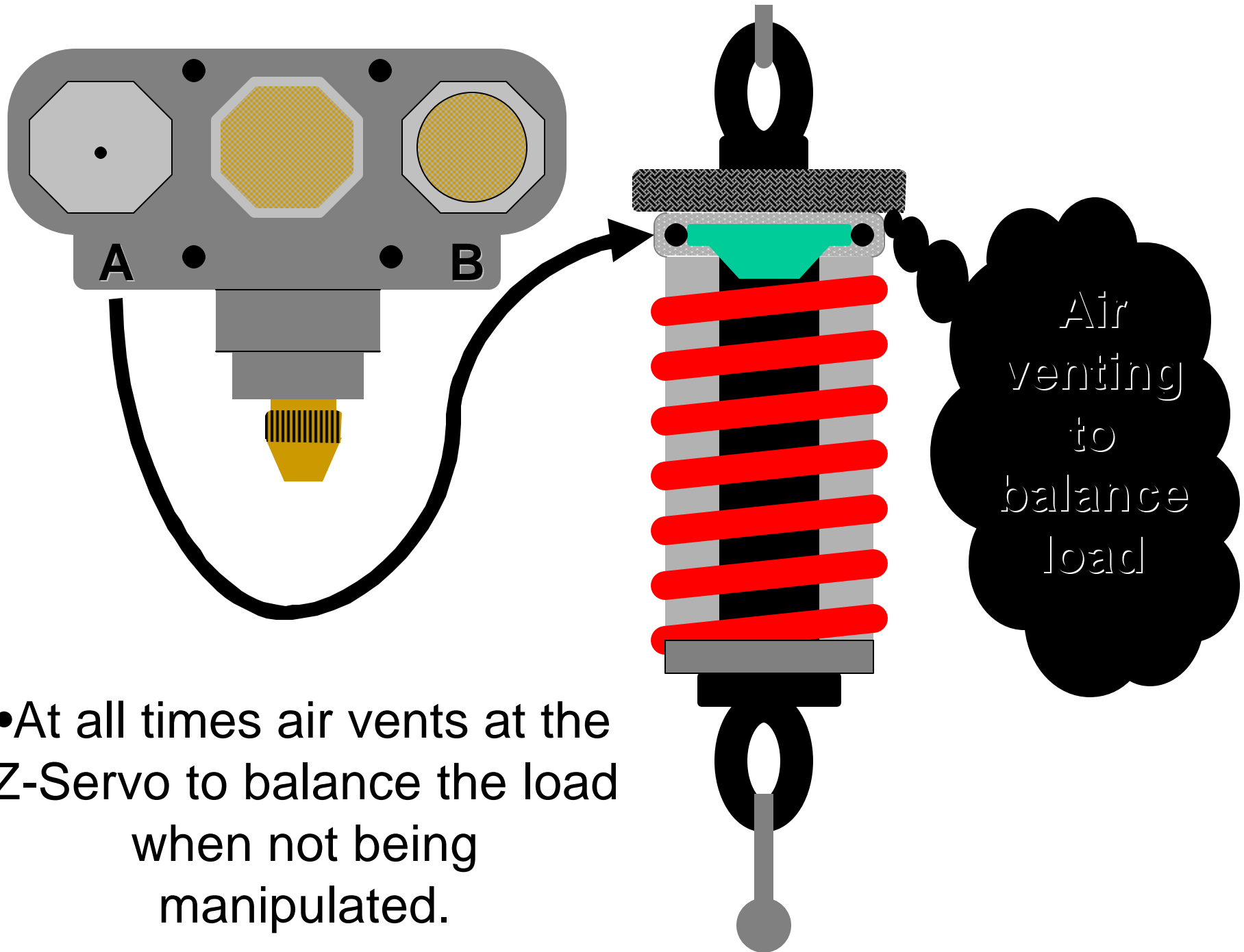


Knurl Nut

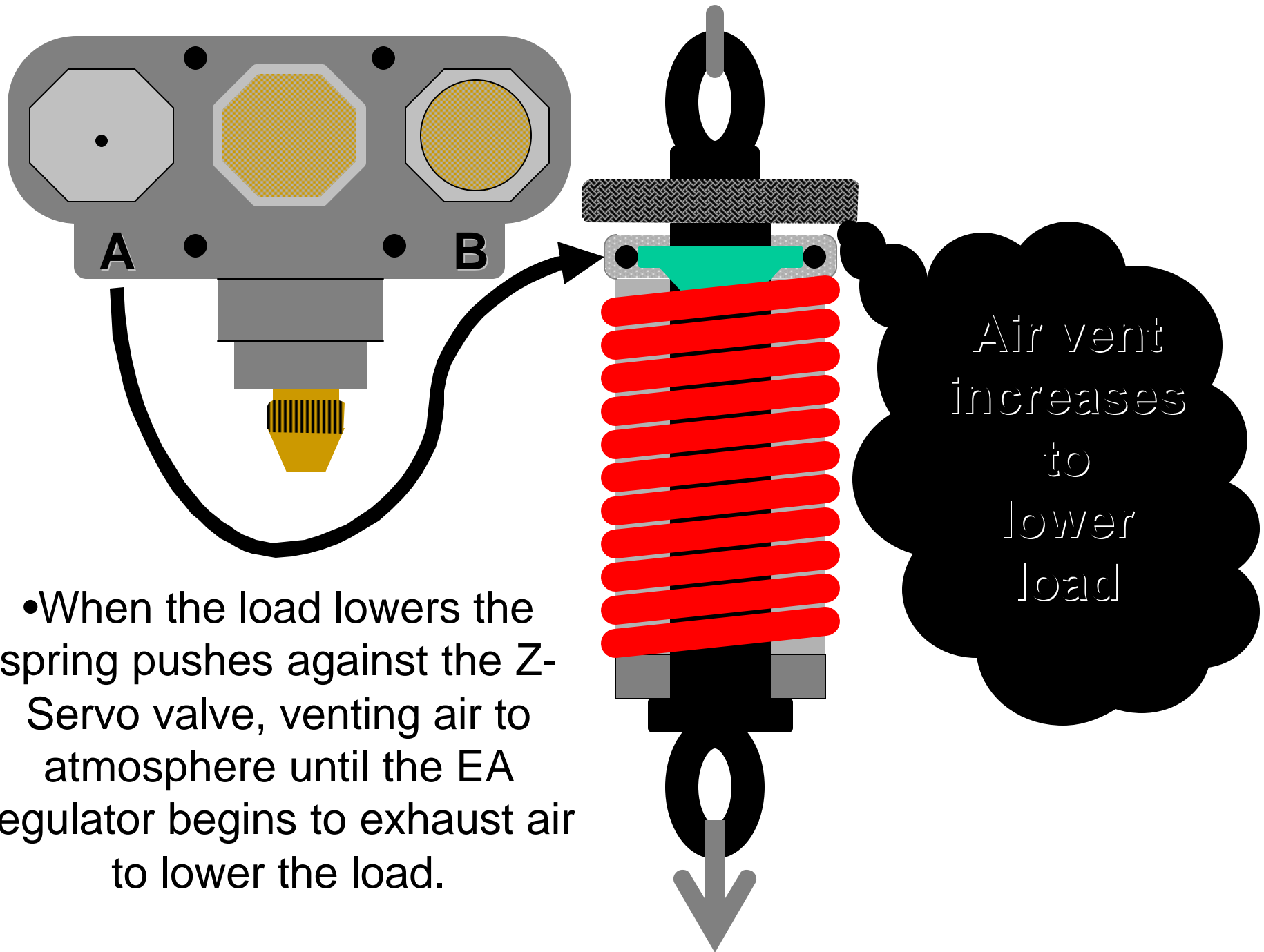
Z-Servo Valve

Servo Body

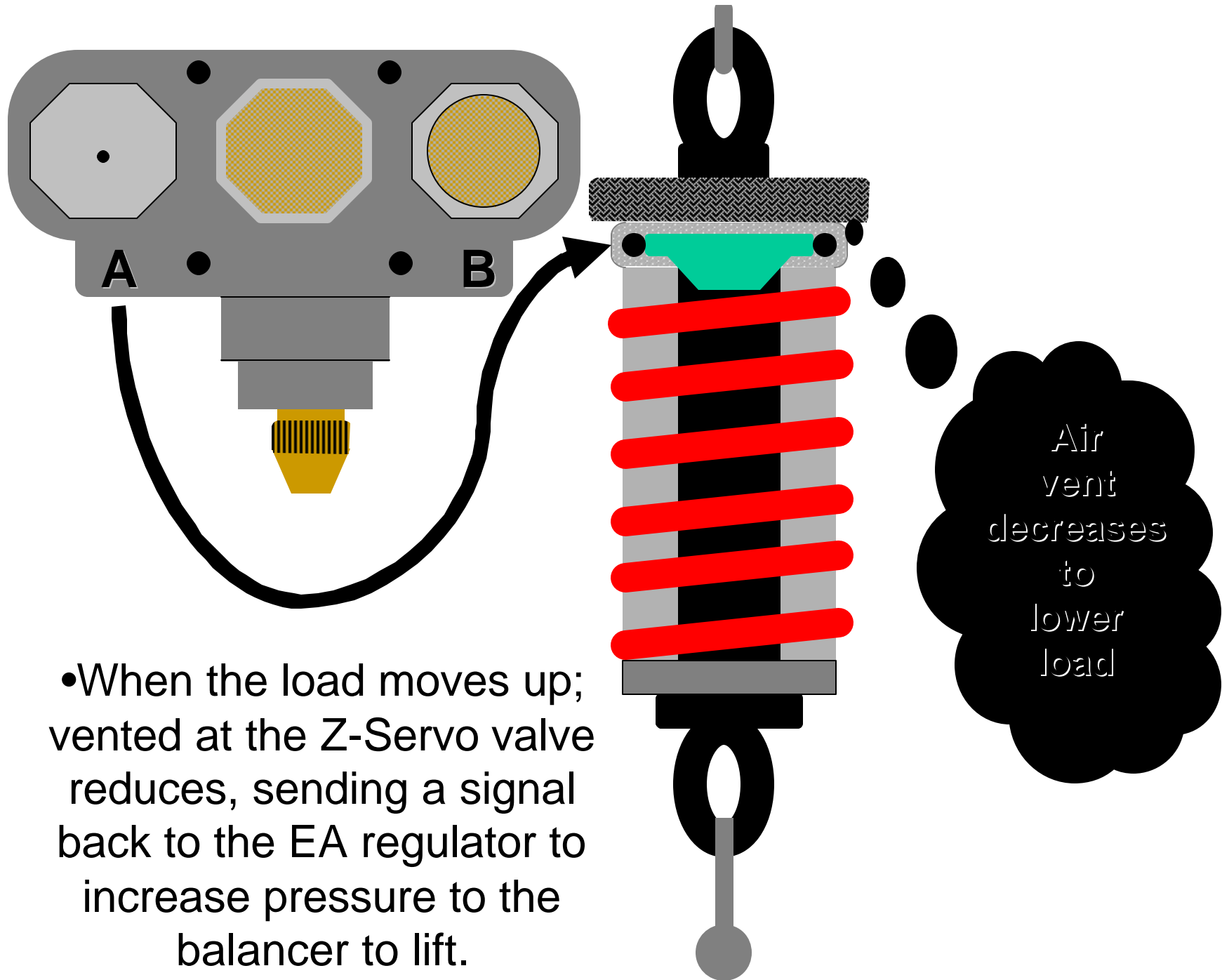
Servo Spring



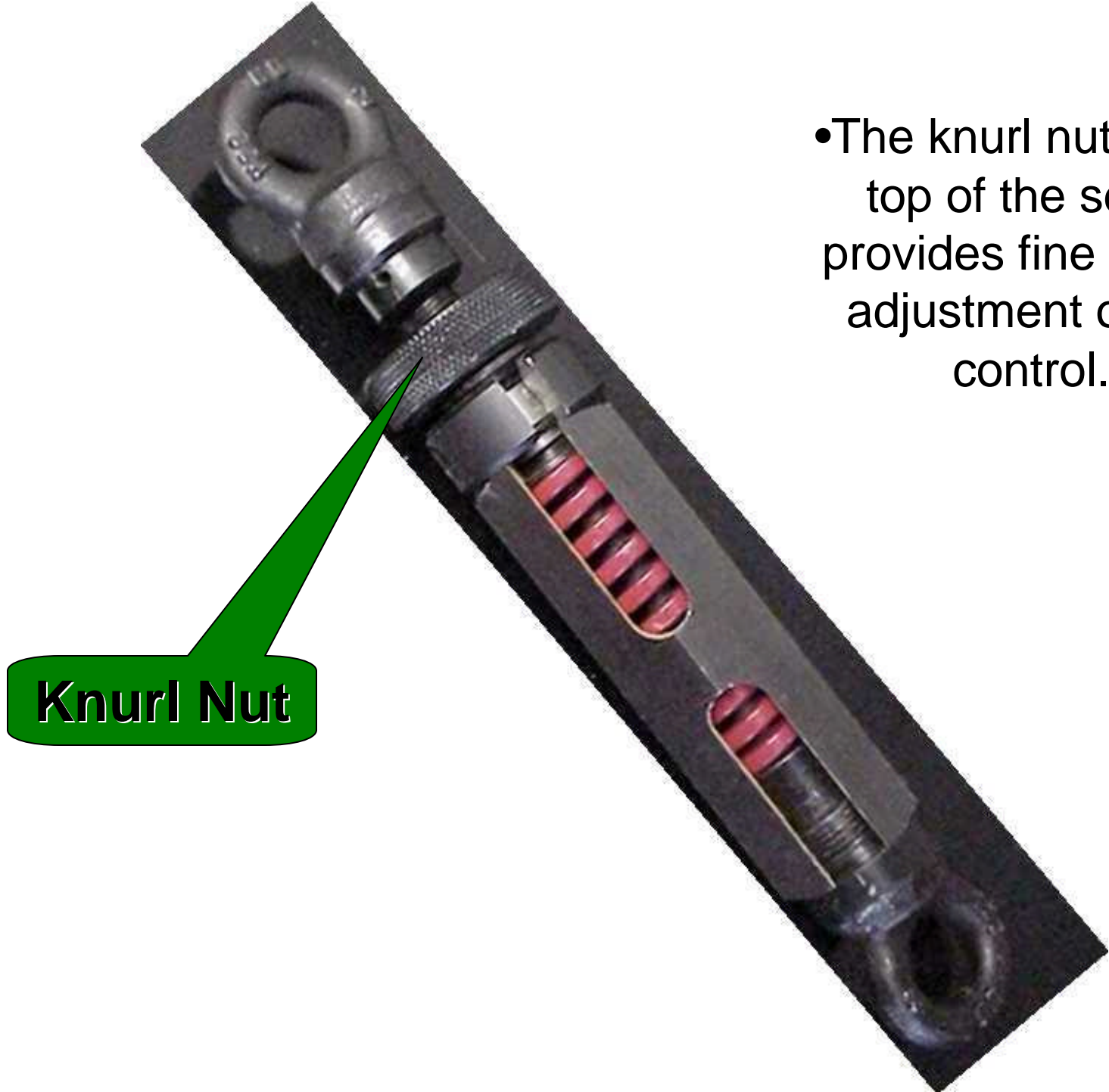
- At all times air vents at the Z-Servo to balance the load when not being manipulated.



- When the load lowers the spring pushes against the Z-Servo valve, venting air to atmosphere until the EA regulator begins to exhaust air to lower the load.



- When the load moves up; vented at the Z-Servo valve reduces, sending a signal back to the EA regulator to increase pressure to the balancer to lift.

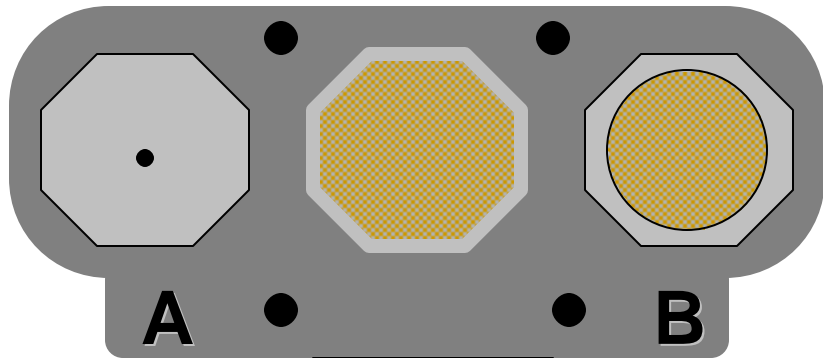


- The knurl nut at the top of the servo provides fine tuning adjustment of the control.

EA Basic Control

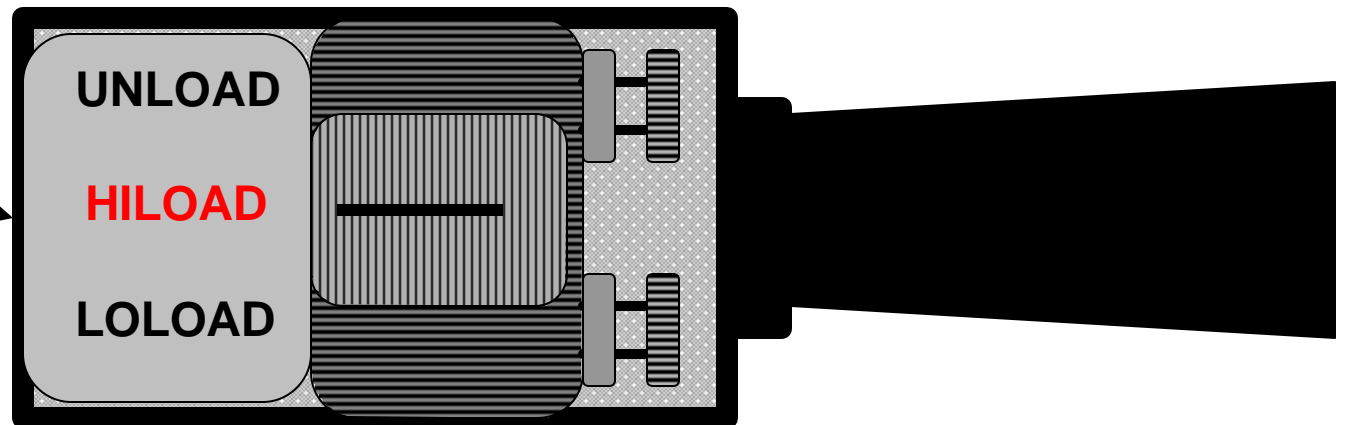


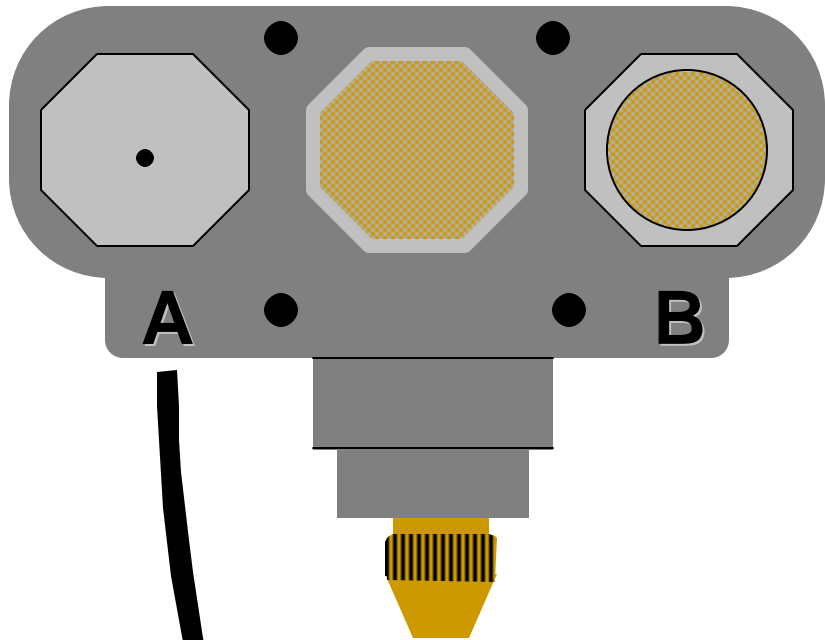
- Balances 3 Different Weights
- Maximum 40 lb. Variation
- 3 Position Pendant Control
 - Hi Load
 - Low Load
 - No Load



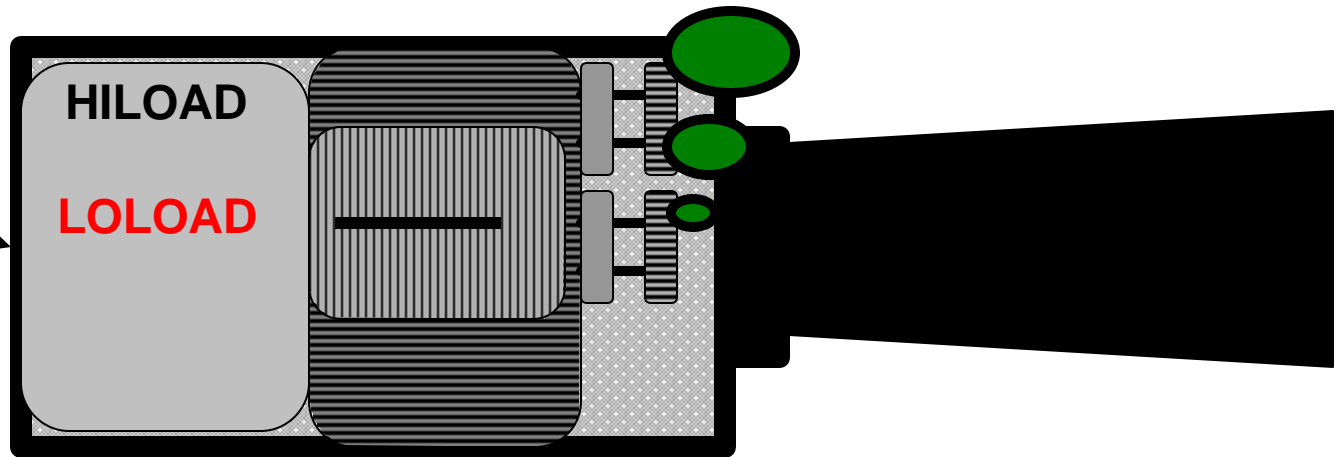
In the HI-LOAD position, the EA regulator setting balances the heaviest load.

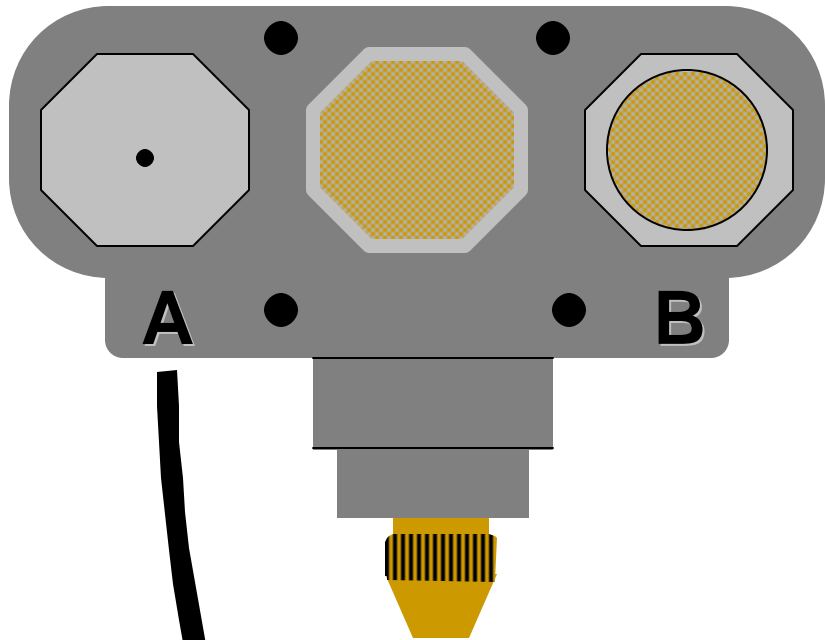
No air vents at the handle.



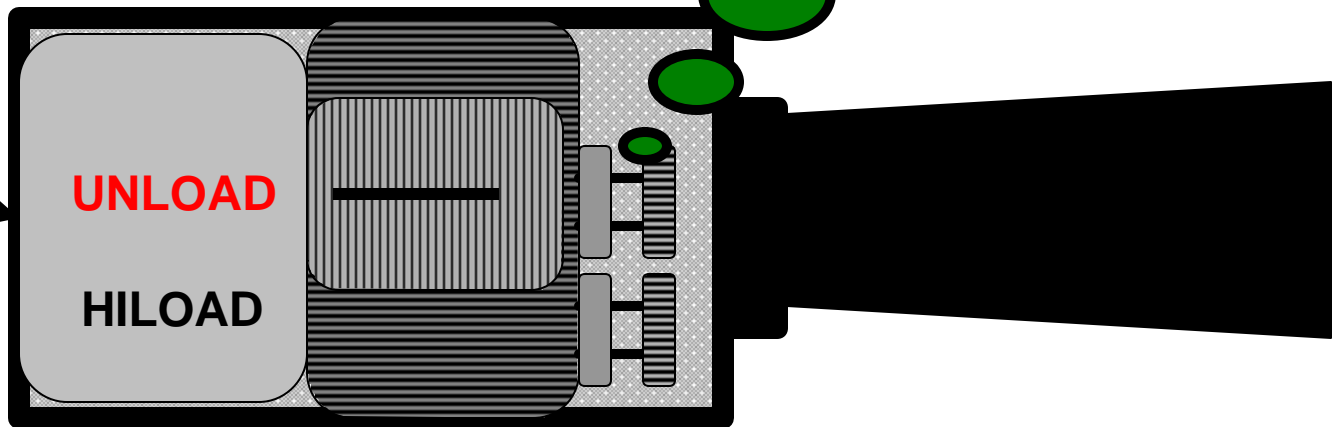
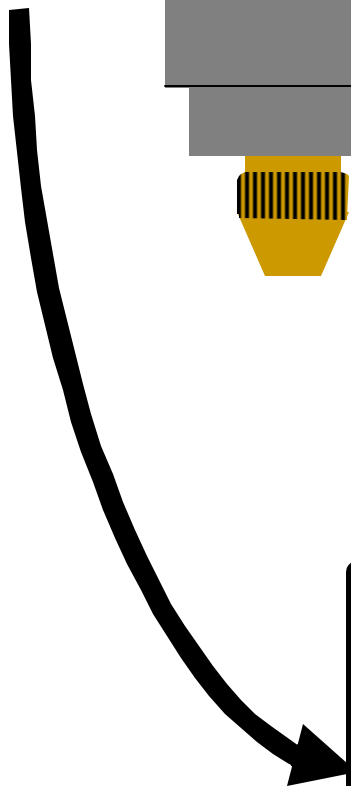


Pressure vents
to atmosphere
to balance
lighter loads.





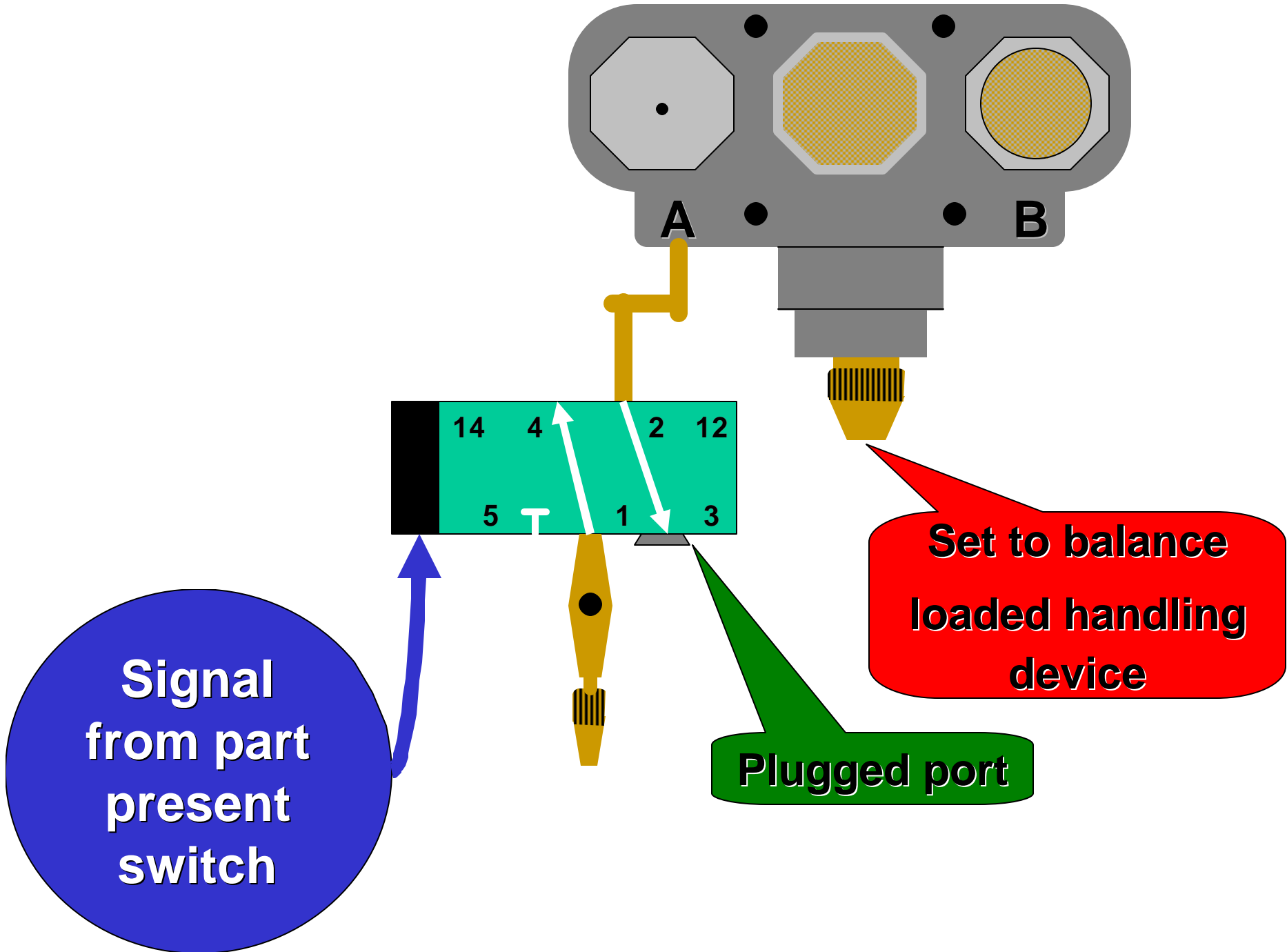
Pressure vents
to atmosphere
to balance
lighter loads.

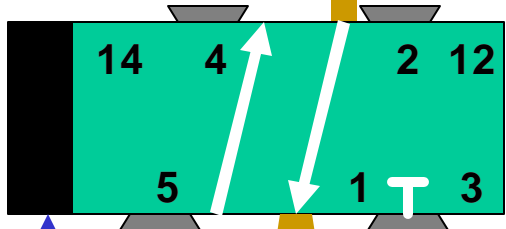
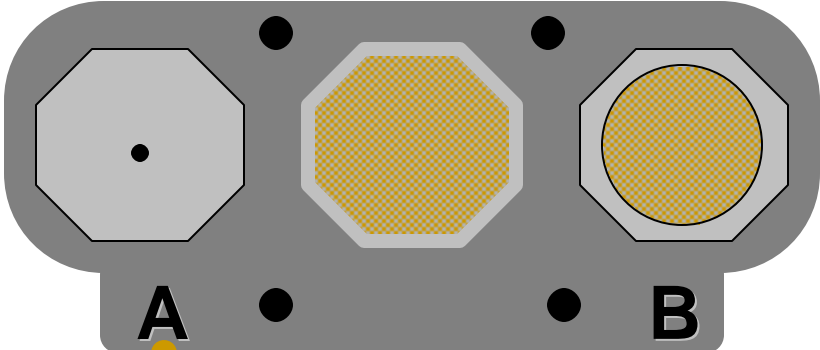


EA-2PS Control



- **Integrated with Handling Device**
- **Above Knees, Below Shoulders**
- **Automatic Clamp & Balance**
- **Empty Handling Device Balanced**

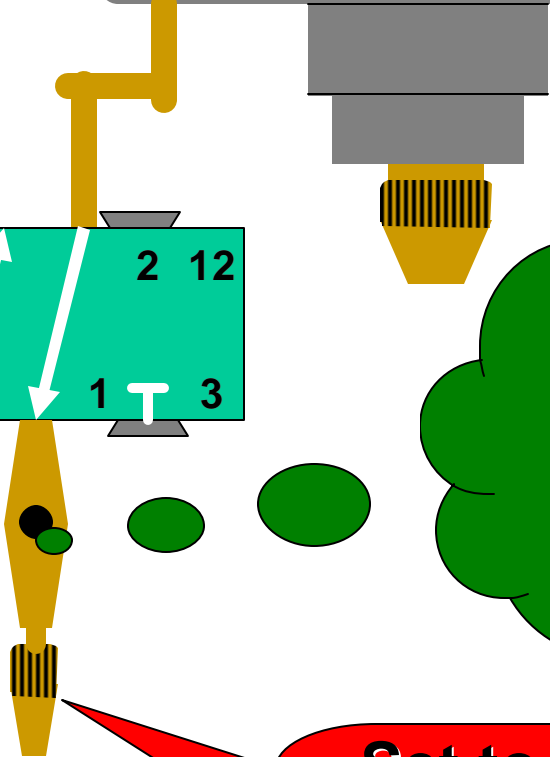




**Air release
balances
empty
device**

**No signal
from part
present
switch**

**Set to balance
empty handling
device**



Interlock

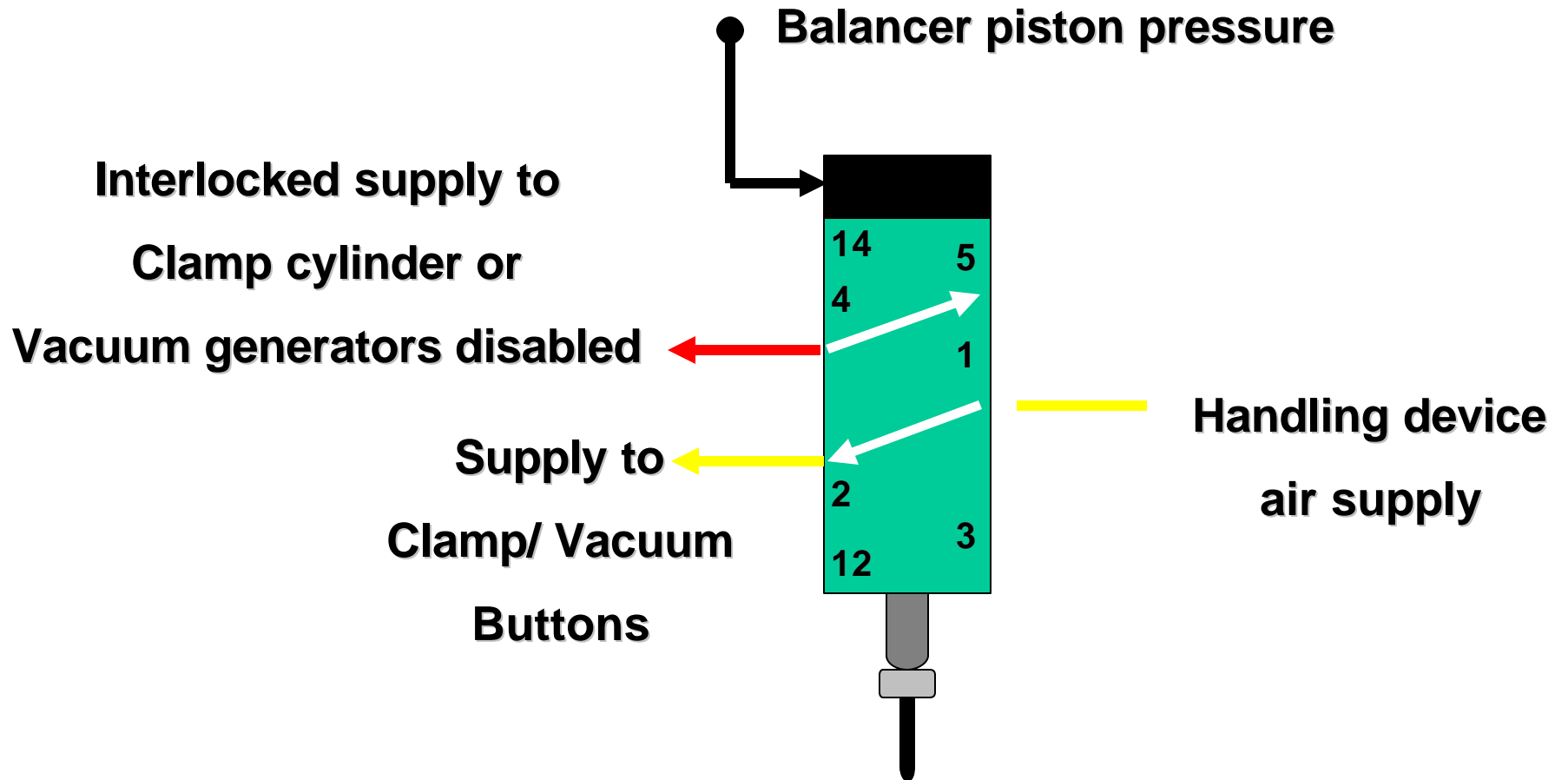
**Prevents accidental release
of a load while suspended**

**Pressure from piston
chamber shifts valve
when a load is attached**



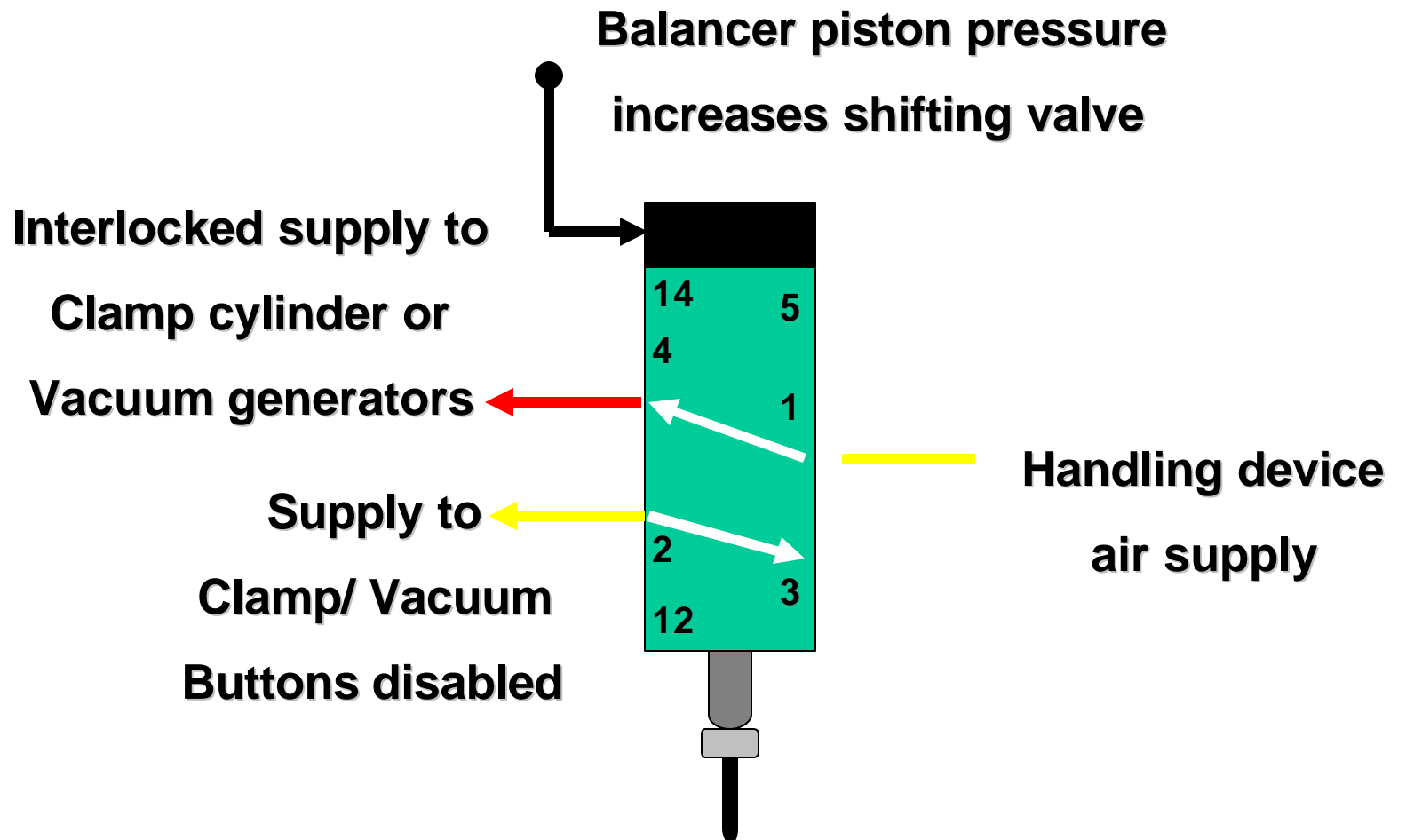
Interlock Normal Condition

Handling Device without load

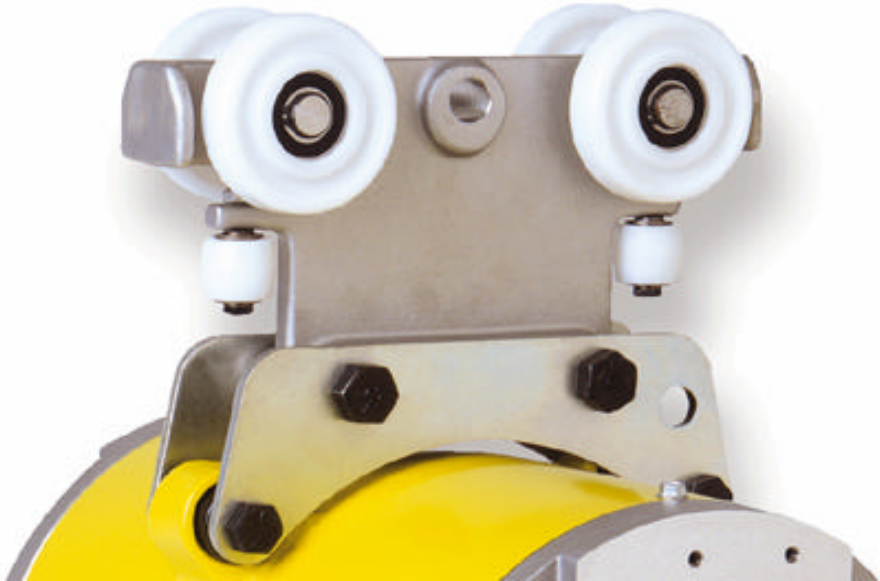


Interlocked Condition

Handling Device with load



Suspension Kits



- Enclosed Track

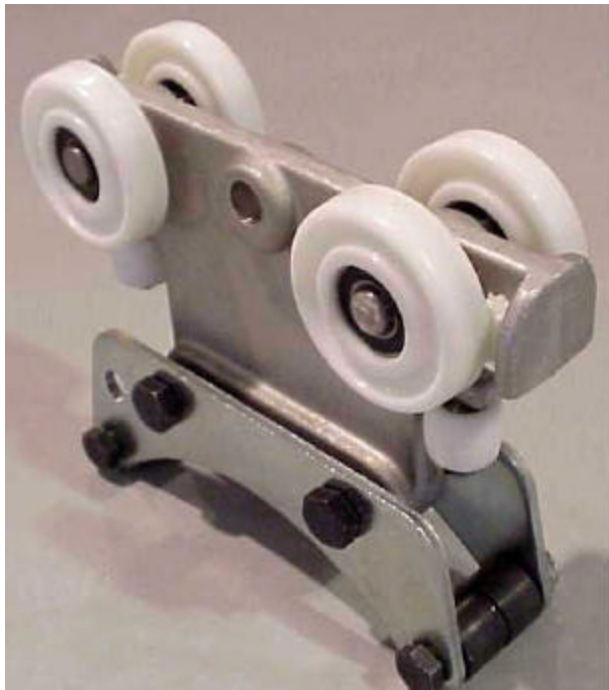
- I-Beam

- Hook Mount



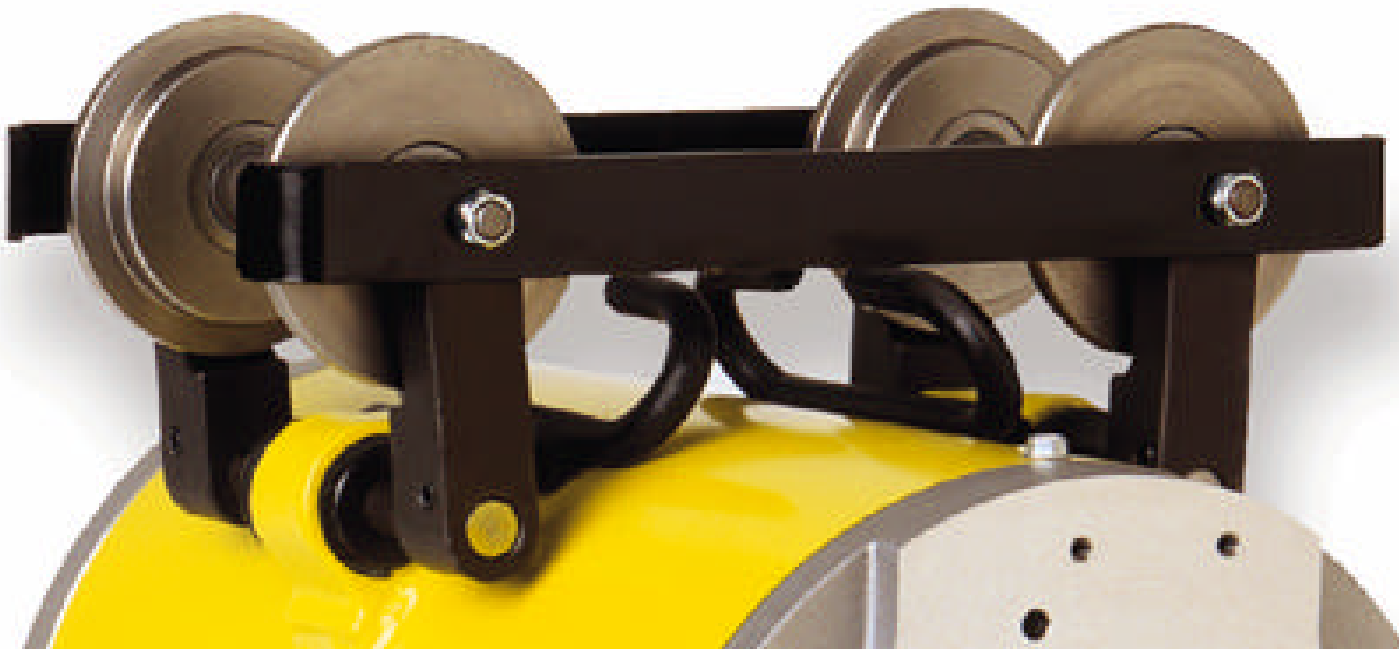
Enclosed Track

- Delrin wheels with life lubed bearings
- All cast Aluminum trolley body



I-Beam

- Adjustable from 2.00 to 4.00 inch running flange
- Special kits can be purchased for wider flange widths



Hook Mount



- Hook Installs closest to cable guide
- Provided with Safety Cable



Summary

CONFIGURED MODEL NUMBER

BALANCER FUNCTION

CONTROLS FUNCTION