

In response to concerns about raw material price volatility and concern over the environmental footprint of packaging, manufacturers have been forced to make process improvements. One primary improvement has been investing in equipment design which minimizes scrap to deliver lower basis-weight materials in the adequate quantity and quality. The benefits of Firestone products allow for simple process improvements to facilitate a reduction of maintenance costs and machine down time which can deliver significant results. Firestone Industrial Products offers more than air springs for the transportation industry, they provide a variety of durable solutions for the packaging industry. Firestone's rugged, reliable air spring products have endless capabilities.

- Broad range of air springs sizes from 2.2 inches to 37 inches in diameter
- Force capability of up to 100,000 pounds
- Superior alternative to pneumatic or hydraulic cylinders or coil springs
- Require no maintenance or lubrication
- Durable and operate well in corrosive and abrasive environments
- Easily accept misalignment
- High ratio of stroke to collapsed height
- Unique capabilities ideal for friction free, leak free, flexible force applications

Explore Firestone's innovative products used on conveying, material handling, and sorting applications in the packaging industries.

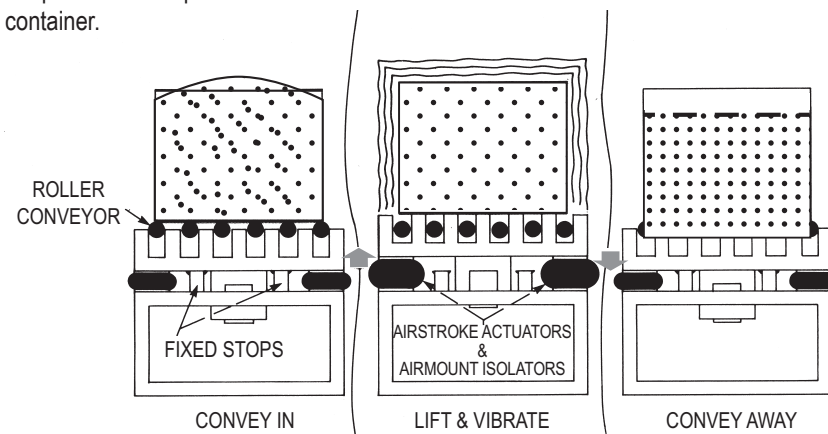
## Vibratory Packer Application

### Application:

- Firestone Airstroke Actuators inflate to lift the container clear of rollers and then isolate vibration from the conveyor system and floor as the product is compacted into the container.

### Advantages:

- Provides vibration isolation from the conveyor and the floor. (Could reduce up to 99+% of the disturbing force!)
- Corrosion resistant.
- Provides lift and isolation in the same unit



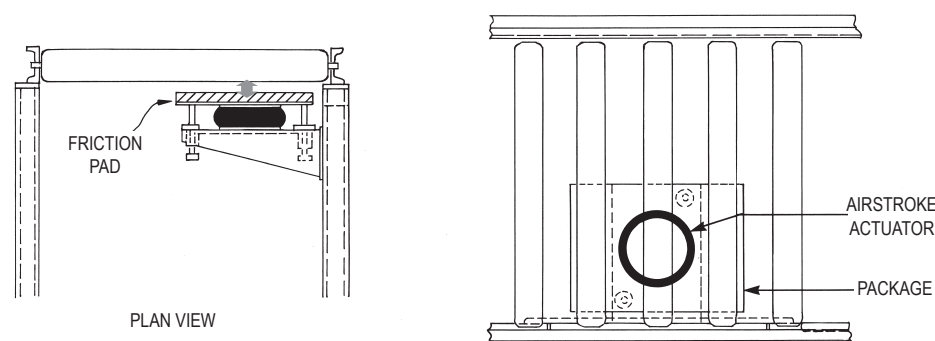
## Conveyor Application: Roller Friction Brake

### Application:

- A friction pad is forced by the Firestone Airstroke actuator against the bottom of conveyor rollers to stop packages. This is an effective method for light loads or at relatively slow speeds. Gravity releases brake pad.

### Advantages:

- Compact, allowing conveyor mounting close to the floor.
- Airstroke Actuator's large effective area allows significant braking force to be applied.



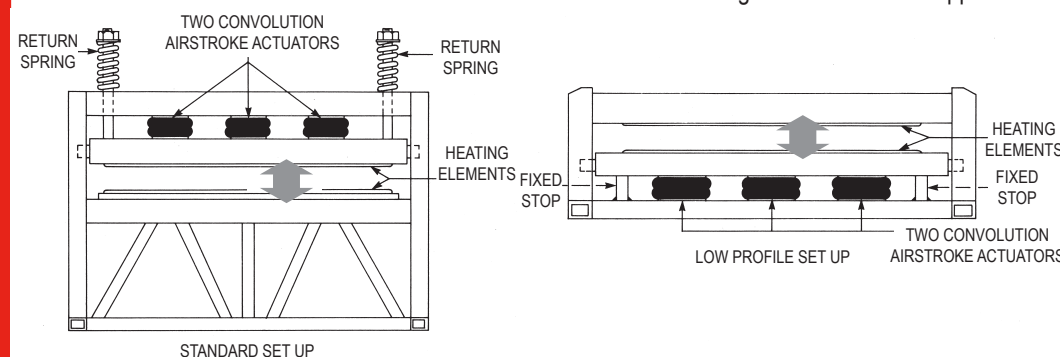
## Heat Sealing Application: Vertically Actuated Heavy Duty Sealer

### Application:

- The vertically actuated heavy duty sealer utilizes Firestone Airstroke actuators to lower the heating elements, in order to heat seal large plastic bags.

### Advantages:

- Compact height allows for minimum starting height and space requirements.
- Firestone Airstroke's large effective area allows a significant force to be applied.



MINIMIZES  
SCRAP

ENDLESS  
CAPABILITIES



REDUCED  
DOWN TIME

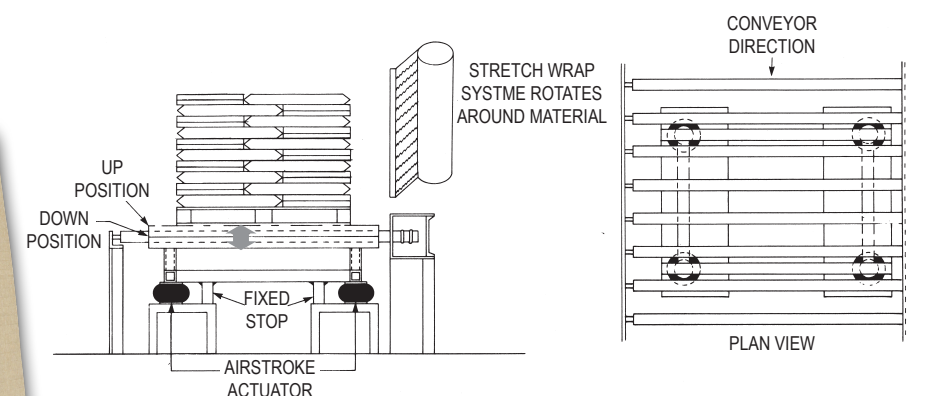
## Stretch Wrap Application: Vertically Actuated Pallet Delay Table

### Application:

- As the palletized load moves down the roller conveyor over the delay table, the four Firestone Airstroke actuators raise the table into contact with the pallet and off the moving conveyor rollers, allowing some type of operation to be performed on the palletized load without stopping the conveyor.

### Advantages:

- Compact starting height provides stroke capabilities of up to two times the compressed height.
- Reduced cost in initial purchase price, installation, and maintenance.



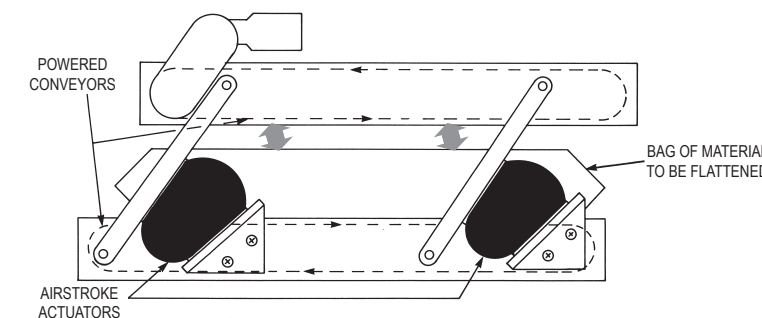
## Conveyor Application: Bag Flattener

### Application:

- A filled bag is brought to the input end where it causes the upper section to be displaced upward. This section is balanced on Firestone Airstroke actuators. By changing the air pressure you can adjust the flattening force applied.

### Advantages:

- Low collapsed height and angular motion capability.
- Very simple mounting arrangements.
- Allows for adjustability not available in coil springs.



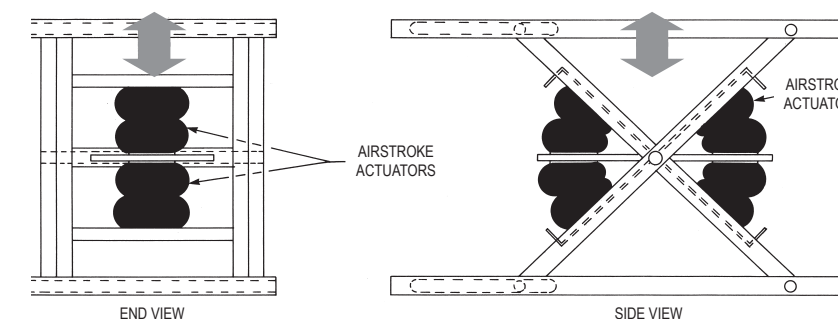
## Scissor Lift Application

### Application:

- The Airstroke actuators are used in this scissor lift application as a low cost means for raising and lowering loads of up to several tons. Inflation of the actuators raises the load while deflation of the actuators lowers the load.

### Advantages:

- Low cost and simplicity of design.
- High force generation eliminates need for expensive hydraulic cylinders.
- Angular motion capability eliminates need for clevises and pivots.







Airmount™ isolators are used to support and isolate delicate objects from external vibrations, or support a vibrating load and prevent its energy from disturbing the surroundings. Airmount isolators provide the highest degree of protection of any type of vibration isolator and can also reduce structurally transmitted noise. Firestone isolators are capable of isolating loads of 100–100,000 pounds per mounting point.



Marsh Mellow™ springs are a fabric-reinforced rubber cylinder used like the Airmount™ isolators to protect systems from the effects of structurally transmitted vibration, without needing air inflation. Marsh Mellow springs are an effective passive isolator with superior characteristics to steel springs. Rubber springs have long been a subject of interest in the vehicular suspension and industrial application fields because of their reliability, corrosion resistance, low cost and basic simplicity. The superior characteristics of rubber and fabric springs surpass steel and rubber-only springs in performance.



Airstroke™ actuators perform the same type of actuation tasks as a hydraulic or pneumatic cylinder. Long used in the industrial market as pneumatic actuators, they have been incorporated into a wide variety of machinery designs in a vast array of industries. The advantages of a flexible-walled pneumatic actuator include: durability; operates well in dirty, corrosive and abrasive industrial environments; easily accepts angular and lateral misalignment; and a high ratio of stroke-to-collapsed height. Its unique capabilities make it ideal for friction-free, leak-free, flexible force applications



AirPicker™ and AirGripper™ end effectors offer the user a wide range of advantages over traditional pick-and-place work-holding devices. Simply by varying the air pressure in the picker or gripper, the user can conform the end effectors to the shape and diameter that is being handled, and to the force being applied to the workpiece. This is especially critical in applications with sensitive, thin-walled or fragile objects. AirPicker and AirGripper end effectors have an elastomeric bladder construction that conforms to any shape. Each picker and gripper can work with a wide range of diameters and workpiece weights. Firestone offers a wide range of standard configurations and sizes of end effectors to meet most industrial applications. Special units can be developed to meet specific application needs.



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## MATERIAL HANDLING

