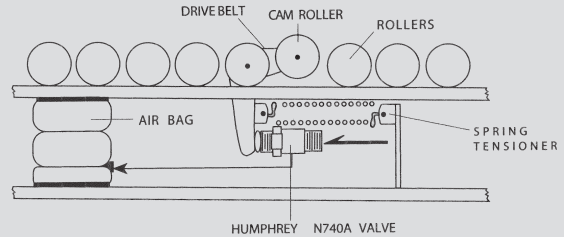




- ❶ One-piece stem with bronze bearing surface for long service life
- ❷ Mechanical actuation – no sliding seals
- ❸ Custom O-ring design for extremely low actuation force



In operation, cartons pass over belt-driven cam rollers. A metered restriction in the N740A valve body limits the depletion of the air bag. The spring tensioner reactivates the valve before the drive disengages, and replenishes the bag.

When a carton stops on the cam roller, the Humphrey N740A valve is held open long enough to exhaust the air bag. This disengages the drive belt from the rollers, and creates a cascade effect along the entire conveyor line.

## Custom Valve

*Assembly Improved Conveyor  
Performance with Lightweight Cartons*



**MATERIALS  
HANDLING**  
SIC:3535

### THE CUSTOMER'S PRODUCT

- The customer designs and manufactures a wide range of custom materials handling conveyor systems.
- Customer wanted to improve a conveyor system for staging lightweight and odd-size cartons.
- Cartons travel up to 500 ft/min as they pass over belt-driven cam rollers.

### THE REQUIREMENTS

- Valve assembly with low actuation force
- Operational life of at least 15 million cycles at rates up to 120 CPM
- Work with the existing mechanical sensors
- Must be field-interchangeable with the existing valve.
- Improve functionality
- Reduce the dimensions of the valve module to allow smaller system footprint

### THE HUMPHREY ENGINEERED SOLUTION

- Humphrey engineers redesigned a standard valve so a positive seal could be achieved by compressing a smaller diameter O-ring against a flat contact surface.
- Achieved the required actuation force of 8 to 12 ounces.
- Redesigned one-piece stem sliding in a bronze bushing for greater wear resistance.
- The new Humphrey valve achieved every performance requirement, including a service life in excess of 100 million cycles.

## THE SOLUTION

Utilizing the Engineered Solutions approach where a Humphrey engineer works directly with the customer's engineering department, the team identified an opportunity to improve conveyor system performance.

Humphrey engineers started with the proven standard model 3P valve. They redesigned the bearing surface to enable the new N740A valve to accept side loads without galling, which would cause increased actuation force. Then they redesigned the O-ring seal to achieve an exceptionally low actuation force of 8 to 12 ounces.

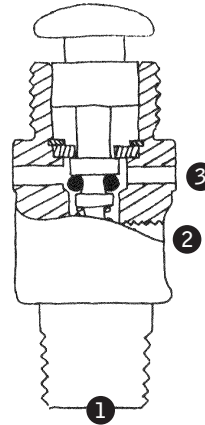
## THE PROCESS

As always, the Humphrey Engineered Solutions team began with the customer's request to improve the functionality of their existing system -- in this case, improve the responsiveness and durability of their existing conveyor valve.

Starting with the proven standard model 3P valve, Humphrey engineers enhanced it to create the new N740A valve that would work in this unique application. In the standard 3P valve the stem O-ring slides into the bore during each cycle, resulting in an actuation threshold that would be beyond this application's parameters.

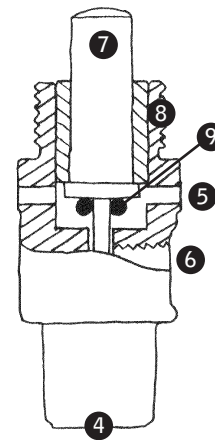
Because the conveyor system would be handling lightweight cartons, the new valve had to have a low actuation force. The Engineering Team redesigned the valve so a positive seal could be achieved by compressing a smaller diameter O-ring against a flat contact surface.

The N740A valve assembly was subjected to exhaustive testing and evaluation against competitive products. The new Humphrey valve achieved every performance requirement, including a service life in excess of 100 million cycles.



3P Standard Model

- 1 In
- 2 Out
- 3 Exhaust



N740A New Model

- 4 In
- 5 Exhaust
- 6 Out
- 7 One Piece Stem
- 8 Bronze Bushing
- 9 O-ring

*Humphrey*

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