

# Technical News Bulletin

October 2006

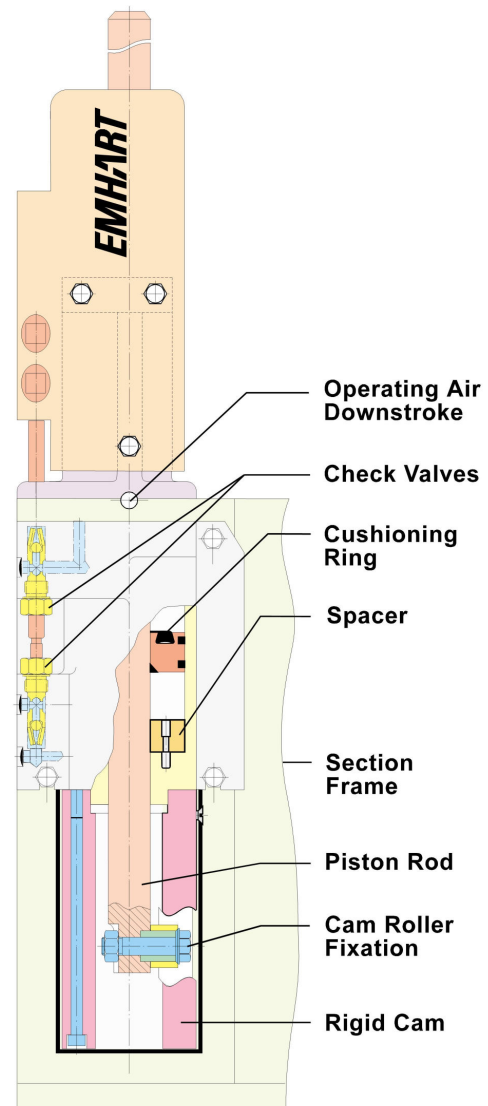
## Blowhead Mechanism for Type 5-1/2" and 6-1/4" Machines

### 1. System Description

Intensive research and development led to the Emhart Blowhead Mechanism which exhibits significantly faster and more precise Blowhead arm movement. Mold equipment service life is prolonged due to improved upstroke cushioning.

Improved pneumatic operating behavior and enlarged air passages ensure more stable operating characteristics. The new mechanism is also provided with adjustable downstroke cushioning which prolongs mold equipment life. During the final movement of the upstroke, an elastomeric ring dampens forces to protect the mechanism and its equipment.

The rigid cam which guides the cam roller of the piston rod features greater mechanical durability. The CNC-machined cam track is closed at both ends. Prolonged service life is attained through improved rigidity of the cam, thereby enabling it to better withstand static and dynamic forces.



## **2. Product Improvements of the Blowhead Mechanism**

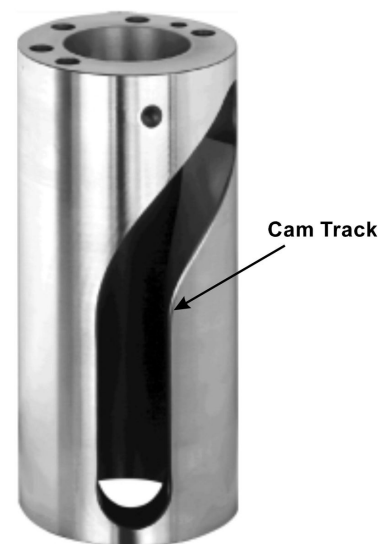
The Blowhead Mechanism features several new improvements which enhance the operating characteristic of the mechanism and prolong its service life.

### **2.1 Rigid Cam**

The rigid cam mounted on the cylinder base serves as a guide for the cam roller which is interconnected with the piston rod and is responsible for the swing motion of the blowhead arm.

The basic improvements involve greater mechanical durability of the cam which is CNC-machined from ball bearing steel. This greater rigidity enables the cam to better withstand static and dynamic forces acting on the cam and prolongs service life.

Correct positioning of the cam is achieved by a locating recess and a dowel pin. Rigid interconnection to the cylinder base is warranted by 5 pretension bolts which prevent loosening due to vibration.

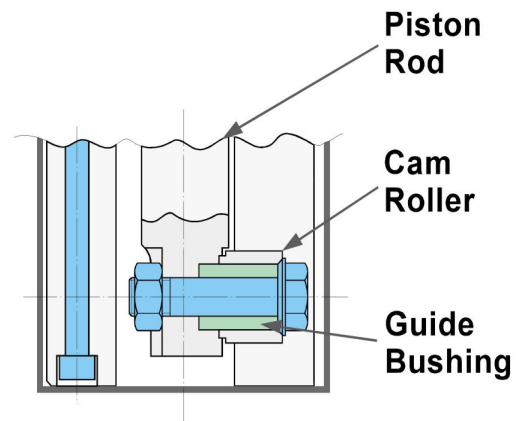


## 2.2 Cam Roller Fixation (Detailed view)

The cam roller travels over the entire path of the cam track. It is mounted on a guide bushing and is mechanically connected to the lower end of the piston rod.

The new fixation configuration is designed to achieve optimal mechanical connection.

Greater modular standardization has been engineered into the individual parts of the cam roller fixation assembly since it can be used for all Baffles, Funnels and Blowheads of the 200 Series (EF 4-1/4" and EF 5" mechanisms) and the 210 Series (EF 5-1/2 and AIS - DG 6-1/4" / TG 4-1/4").



### 2.3 Automatic Lubrication

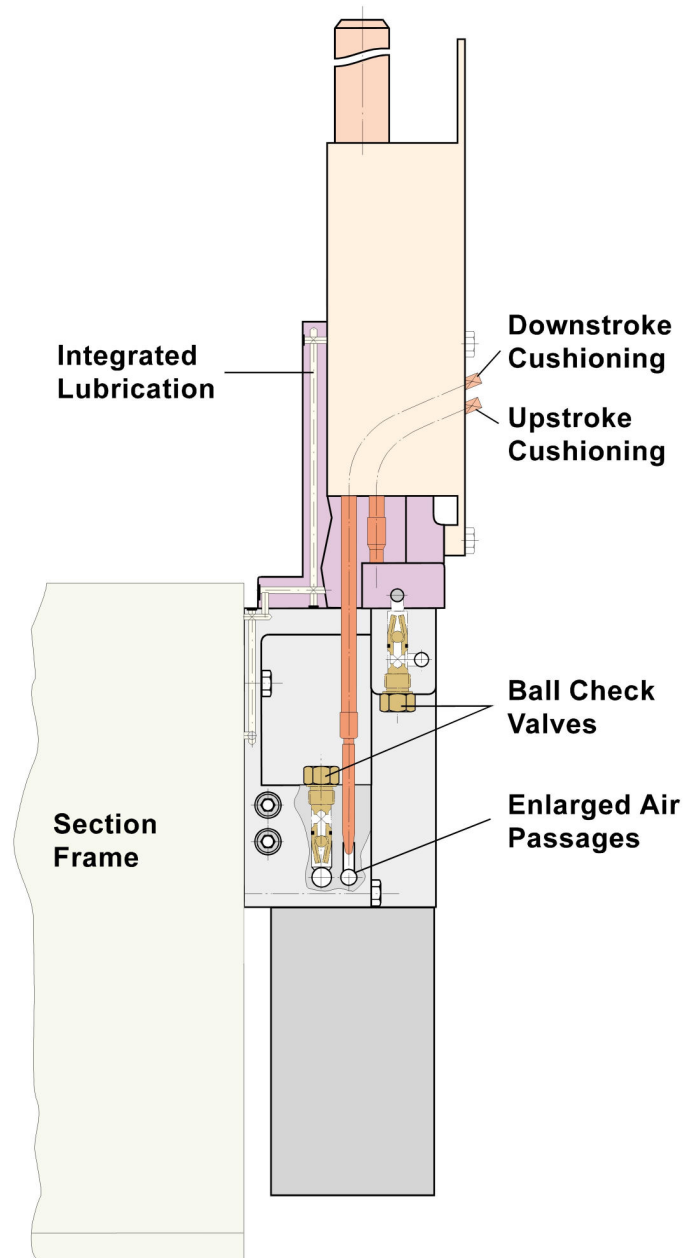
Lubrication lines are fully integrated in the new design. Lubrication prolongs the service life and reduces both piston rod and bushing wear.

### 2.4 Cushion Control Valve

Precision needle valves are used for fine adjustment of the cushion control of the upstroke and downstroke. An extension rod located behind a cover makes it possible to adjust cushioning during blowhead operation. By eliminating the previous cushion control air piping and replacing it with the cushion control valves, the cushioning characteristic has been greatly improved.

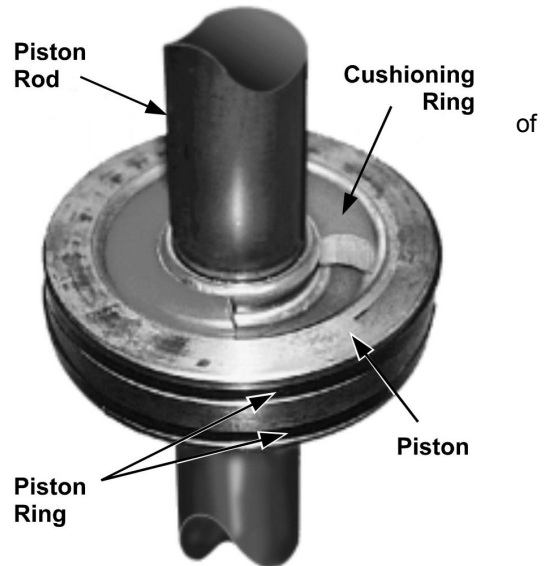
### 2.5 Ball Check Valve

The two ball check valves open to permit air flow for the downstroke and upstroke. The design, for which a patent is pending, improves air flow characteristics and the result is considerably higher operating air throughput.



## 2.6 Piston Rod Cushioning Ring

The damping effect of the elastomeric ring during the final movement of upstroke cushioning extends the service life of the blowhead mechanism, the blowhead arm and the blowheads.



## 3. Performance Characteristics

The following graphs show a comparison between the previous and the new blowhead mechanisms. Measurements are based on a basic equipment configuration with fully opened speed control valves.

### 3.1 Long Stroke Version

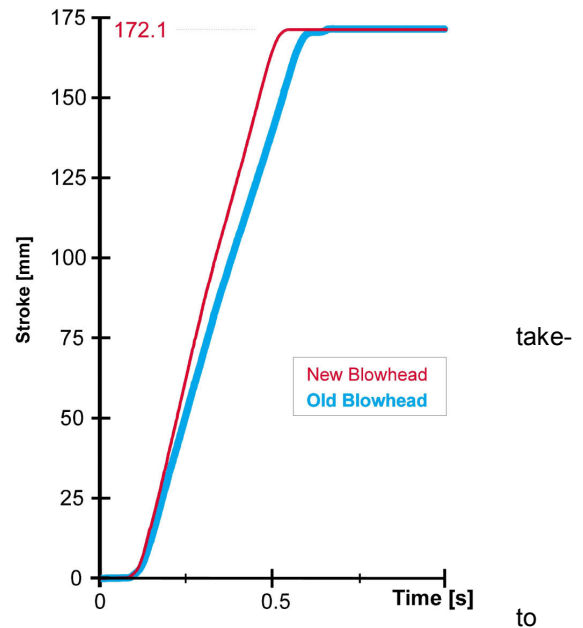
The long stroke version features a 172 mm overall stroke which includes a vertical stroke of 80 mm.

#### Speed Increase

Due to faster mechanism, the required time for the blowhead arm upstroke motion is reduced by 12.5 %. Longer blowhead “ON” is permitted without altering out “IN” timing, due to the increased blowhead mechanism speed.

#### Upstroke Cushioning

There is a significant improvement in upstroke cushioning on the new blowhead mechanism. The Blowhead arm comes to a smooth stop, which serves to extend the service life of the blowhead arm and the mold equipment.



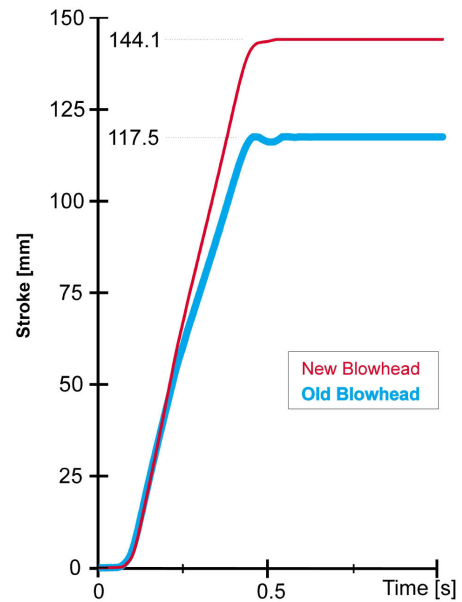
### 3.2 Short Stroke Version

#### Increased stroke

The overall stroke on the new mechanism is now 144.1 mm compared to 117.5 mm of the previous design. A longer cooling tube can be used on the blowhead arm due to the 52 mm straight stroke.

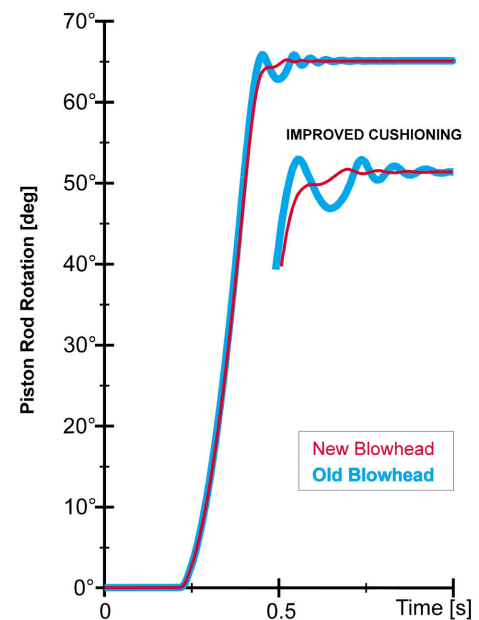
#### Speed Increase

Even with the larger stroke, the time for the downstroke and upstroke motion is identical compared to the previous mechanism. This is achieved with the faster mechanism.



#### Upstroke Cushioning

There is a significant improvement in upstroke cushioning on the new blowhead mechanism. The blowhead arm comes to a smooth stop, which serves to extend the service life of the blowhead arm and the mold equipment.



## **4. Availability**

As of August 1996, Blowhead Mechanisms Series 210-210 will be supplied separately as well as factory installed for Type 5 ½" & 6 ¼" IS machines in the following configurations:

Part No.	Section Frame Height	Total Stroke	Operation Air Supply
210-210-1	Standard	144	External
210-210-2	Standard	172	External
210-210-3	Standard	144	Thru Frame
210-210-4	Standard	172	Thru Frame
210-210-5	65 mm increased	144	Thru Frame
210-210-6	65 mm increased	172	Thru Frame

The new blowhead will replace 23-76 and 23-270 all groups.

Phased-out mechanism will no longer be manufactured after September 1996. Only the new blowhead mechanism will be commercially available after this date. Wear parts for the replaced mechanisms will be supplied until the end of the year 2000.

## **5. Installation Requirements**

### **5.1 Mounting on F & EF machines**

No modification is required for installing the new Blowhead Mechanism. All interfaces are identical so that existing mold equipment and accessories can be used.



## **6. Blowhead Mechanism Features and Benefits**

### **6.1 Features**

- Improved cam design and cam roller fixation
- Externally accessible ball check valves
- Adjustable downstroke cushioning
- Optimized upstroke piston rod cushioning
- Integrated air and lubrication piping
- Enlarged air passages
- Precise mechanism movement
- Improved pneumatic behavior
- Totally compatible with previous F + EF mechanism for DG 5-1/2"
- Standardized mechanisms and spare parts

### **6.2 Benefits**

- Speed increase up to 12.5% during upstroke
- Fewer finish defects
- Less wear on blowhead arms and mold equipment
- Compatibility with existing mold equipment
- Greater maintenance convenience
- Prolonged mechanism service life
- Reduced inventories for mechanisms and spare parts