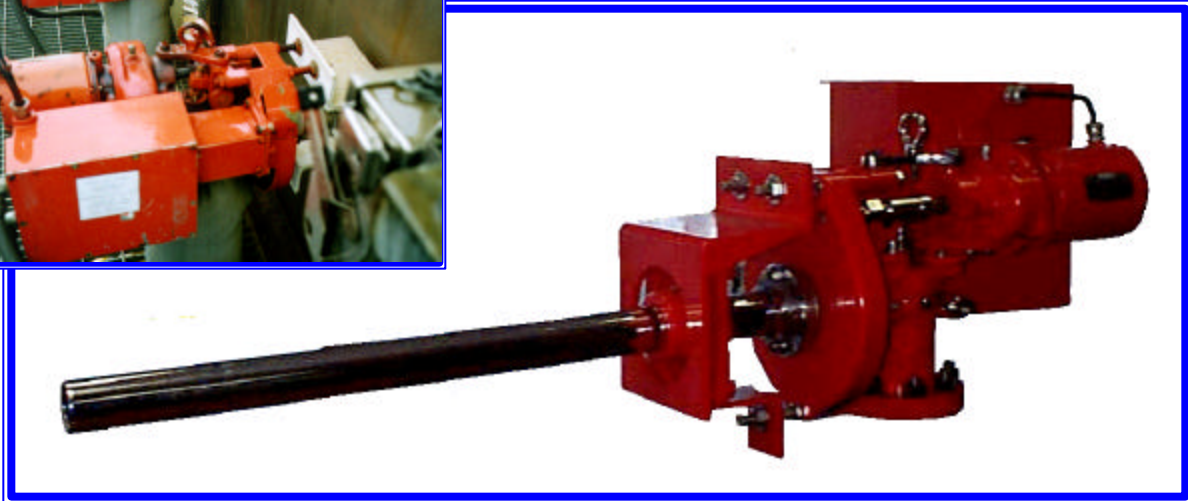


## MODELS D5E & D5M

## ROTARY SOOTBLOWERS



### General Description

The Clyde Bergemann Model D5E (Electric) and D5M (Manual) Rotary Sootblowers offer dependability in boiler cleaning and ease in operation. The D5 Rotary has been part of the Copes Vulcan (Sootblower Division purchased By Clyde Bergemann in 1997) product line for many years with thousands of units providing excellent service worldwide. The D5 Rotary features a simple design concept, which equates to minimal maintenance cost and trouble free operation.

The Clyde Bergemann Model D5 rotary sootblower is designed to clean convection surfaces of packaged or field erected industrial boilers. The blowing element of this type sootblower remains

in the boiler at all times, supported by element bearings usually attached to the boiler tubes. Specially designed nozzles are located on the element (as required) for each specific installation. Saturated or superheated steam, as well as compressed air, may be used as the blowing medium. The D5 can operate in temperatures up to 1800° F with the proper choice of element material.

To prevent infiltration of corrosive furnace gases through the element to the valve assembly, a scavenging air check valve is furnished as standard equipment on the D5 rotary sootblower. For pressurized furnaces a purging airline from a source of higher pressure than the furnace is connected to the scavenging air valve.

## Operation

On the D5E the drive motor rotates the element, through the bull and pinion gearing, in a full 360-degree arc about its axial centerline. Rotation is normally clockwise at 2 rpm. Blowing medium admission is controlled through a mechanically cam operated valve in the valve head. Blowing medium is turned off when the blowing sweep is completed and the cam follower disengages from the cam. The blowers are designed for either individual operation or for use in a sequential system.

The blowing sweeps are regulated by preselected cams mounted on the bull gear. The “poppet valve” is mechanically held open during the blowing cycle. The valve automatically closes after completion of the blowing sweep. After initiation from the start signal the model D5E Rotary Sootblower is automatically self-controlled. The proper stop point is determined by a limit switch positively driven by the bull gear to eliminate the possibility of phase shifting between the blowing arc and rotary blower stop position.

The cleaning sweep can be adjusted by simply removing sections of the opener

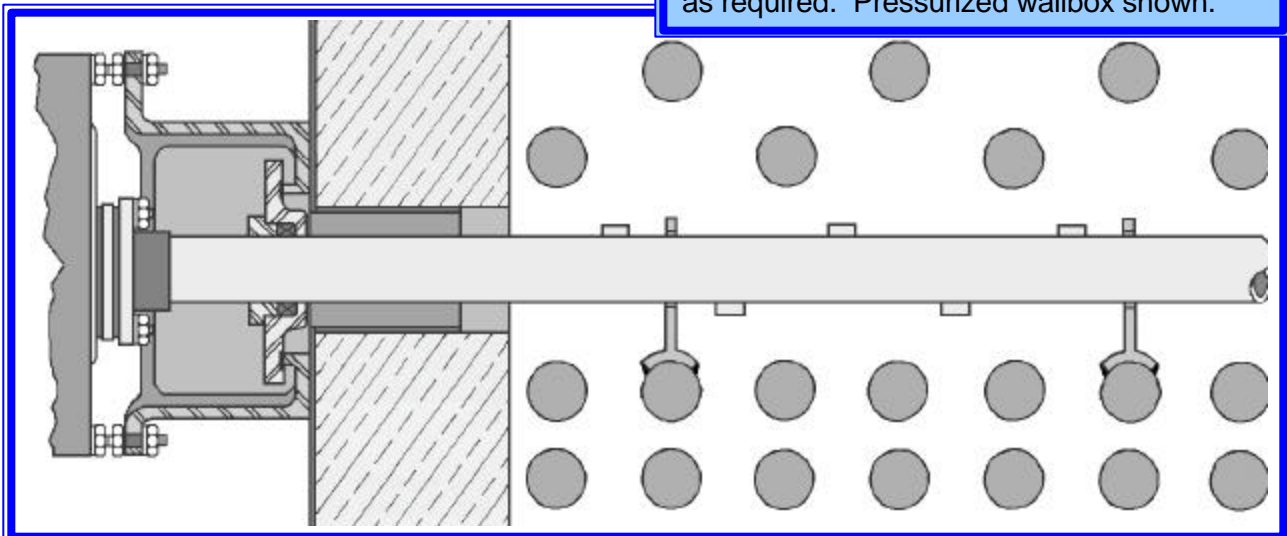
cam. The arc can be adjusted from 360° through 90° in 30° increments. Also, the travel direction can be counterclockwise if desired. Addition of suffix “S” to the D5E (D5ES) means sequencing is provided. The blowers cut in, blow, cut out and bring in the next blower in series. Only the first blower need be started.

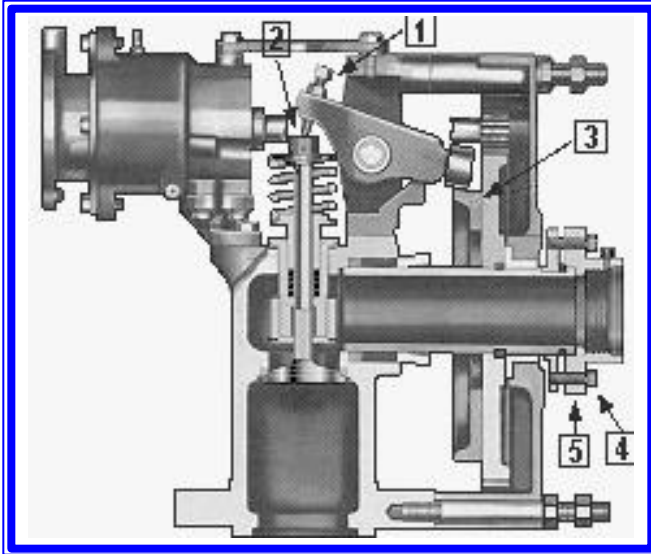
## Element Removal

The connection between element and head is a flange – not a pipe coupling. This flange is outside the boiler, away from the dirt and corrosive fluids. This also helps to prevent element warpage and binding. The head is quickly and easily removed from its mounts. First, bolts are removed from two flange sets. Second, the head is lifted away, leaving the element in its normal position in the furnace. With the head removed, it is a simple matter to slide the element out, should it need replacing. The connecting flange, under normal conditions can be re-used.

### **Rotary Sootblower Installed**

The line drawing below demonstrates a rotary sootblower installed in a boiler with either staggered or in-line tubes. Note arrangement of the nozzles to properly clean all tube banks. Support bearings supplied as required. Pressurized wallbox shown.





### DVT-FS Sootblower Poppet Valve

The DVT-FS Sootblower poppet valve is a valve designed to regulate the flow and pressure of cleaning medium being fed to a sootblower. The unit features enhanced sealing ability and service life by the use of a flat seat with a seat protection device. Seat damage is minimized by controlling the majority of the pressure drop across a downstream adjustable throttling ring, and additionally by means of a special contour immediately adjacent to the flat seat, which bears the pressure drop during the initial opening of the valve.

**Blowing Pressure Easily Adjusted** – Drive screw (1) adjusts the stroke of the cam while the hex valve stem cap (2) can be rotated for either a reduction or increase in blowing pressure. Exact pressure can be determined with use of optional gauge permanently mounted on poppet valve.

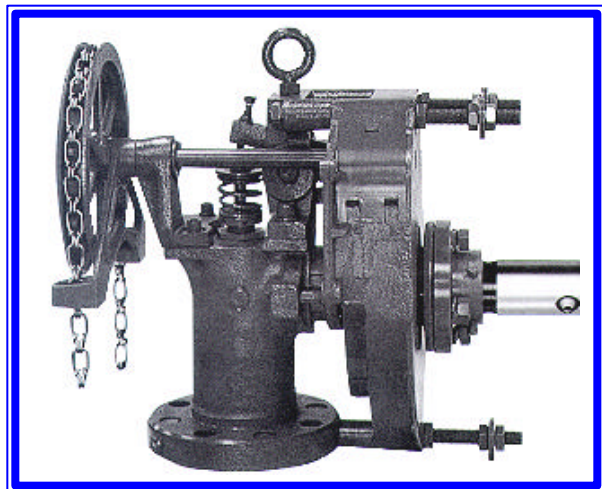
**Head Construction** – Standard heads and flanges are fully rated for ANSI

Class 600 WCB. Other materials and classes are also available.

**Blowing Arc Readily Changed** - Add or remove cam segments (3) on main gear. No need to remove head or cut new cams.

**Element Easily Removed** – Element is attached by means of a flange. (5) Head is attached to wall sleeve adapter by three jack-studs. (4) Remove the nuts from the jack-studs and lift head out, slide element out for inspection and/or replacement. No special tools required.

**Main & Power Gears Covered** – Final drive pinion is heat treated for maximum service. Pre-lubricated gear train is totally enclosed impervious to dirt.



### Manual D5M Rotary Sootblower

For those applications where an electrical drive is not feasible, the D5M manual rotary sootblower is available. These units utilize a hand operated chain wheel drive for rotation. The function of the sootblower is the same with the exception of the drive method. Because of the 15:1 two step gear train ration, the effort required to operate this D5M is surprisingly low.

## Standard Specifications

### **Drive/Electrical (D5E Only):**

|                  |  |
|------------------|--|
| Motor            | 1/8 HP, 230/460 volt, 3 phase, 60 Hz, 1800 RPM<br>TENV |
| Limit Switches   | Heavy Duty Mechanical                                  |
| Switch Box       | Cast Aluminum, NEMA 4                                  |
| Drive            | 40:1 Bull and Pinion Gear Set                          |
| Gear Box         | Fully Enclosed Reduction Type Gearbox                  |
| Element Rotation | 2 RPM  |

### **Head:**

|                  |   |
|------------------|---|
| Rating           | Carbon Steel, ANSI Class 600, ASTM A216,<br>Grade WC-B (Optional WC6 Available) |
| Poppet Valve     | Type 410 Stainless Steel (prehardened)  |
| Seat             | Solid Stellite Insert   |
| Companion Flange | ANSI Class 600  |
| Pressure Control | External Adjust, Internal Control   |

### **Dimensions:**

|        |   |
|--------|---|
| OAL    | 30 Inches, 32.5 Inches with Pressurized Wallbox |
| Height | 14 Inches                                       |
| Width  | 13.81 Inches                                    |

### **Element / Support Material:**

|                       |                   |
|-----------------------|-------------------|
| 2" Sch. 80 Steel Pipe | 0 – 900° F        |
| 2" Sch. 80 304 SS     | 900° F - 1600° F  |
| 2" Sch. 80 446 SS     | 1600° F - 1800° F |

## General Sootblower Specification Sample

**Rotary Sootblower Structure** - The rotary sootblower structure shall be designed in such a fashion as to allow ease of maintenance, durability in operation and effective boiler tube cleaning. It is preferred that the structure be a modular design using a cast frame to attach subassemblies to. As a minimum the structure shall be coated using an organic primer base coat and an epoxy top coat.

**Rotary Sootblower Gearbox Assembly and Motor** - The sealed & lubricated gearbox assembly shall be mounted to the main frame and shall have a standard frame flange. The drive shall be through a bull and pinion gear arrangement. The drive motor shall be at least a 1/8 HP electric motor with a 1.15 service factor and class B insulation.

**Sootblower Poppet Valve & Related Parts** - The poppet valve shall be the seat and plug style with a cast body using at least a WCB

material. The valve housing shall be made to ANSI standards and shall include the companion flange. The valve pressure adjustment shall be accomplished externally without affecting seat opening. The valve actuator shall be a cam and follower arrangement. The cam shall be adjustable to vary blower sweep.

**Rotary Sootblower Control System** - The rotary sootblower shall be electrically operated using plant voltage available. There shall be a terminal box available for field wiring. The start and stop function shall be prewired and ready for field wiring. All wiring and terminals shall be labeled.

**Rotary Sootblower Element** - The element shall be designed to meet the specific temperature and furnace gas conditions. The element shall be flanged to the head assembly. The sootblower drive and electrical system shall be designed to allow the element venturies to be adjusted and preset to a permanent rest position without drifting.

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