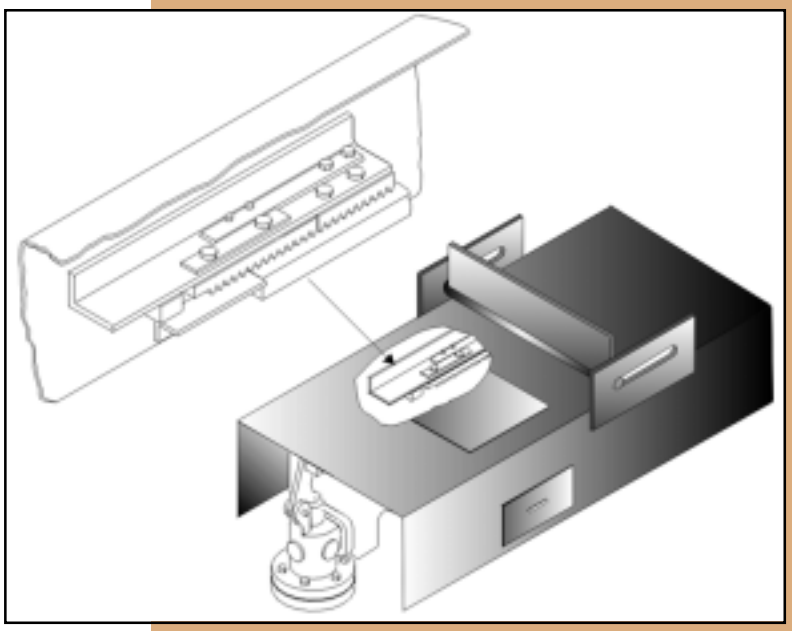
Diamond Power Specialty Company

Progressive Helix Mechanism (PHM)

PHM is required on both the left and right sides of the sootblower.



Problem:

Sootblower nozzles travel along a helical pattern as the lance tube inserts and rotates. If the same helical path is followed time after time, boiler tube erosion may become severe at points where the steam flow repeatedly impacts the leading edges of the tube bank.

Solution:

Diamond's patented Progressive Helix Mechanism (PHM) device is a precision, geared indexing mechanism that shifts the nozzle starting position by a known amount each and every cycle. Hundreds of operating cycles are required before the nozzle repeats the same path again. This ensures a more complete cleaning coverage and significantly reduces tube damage due to erosion.

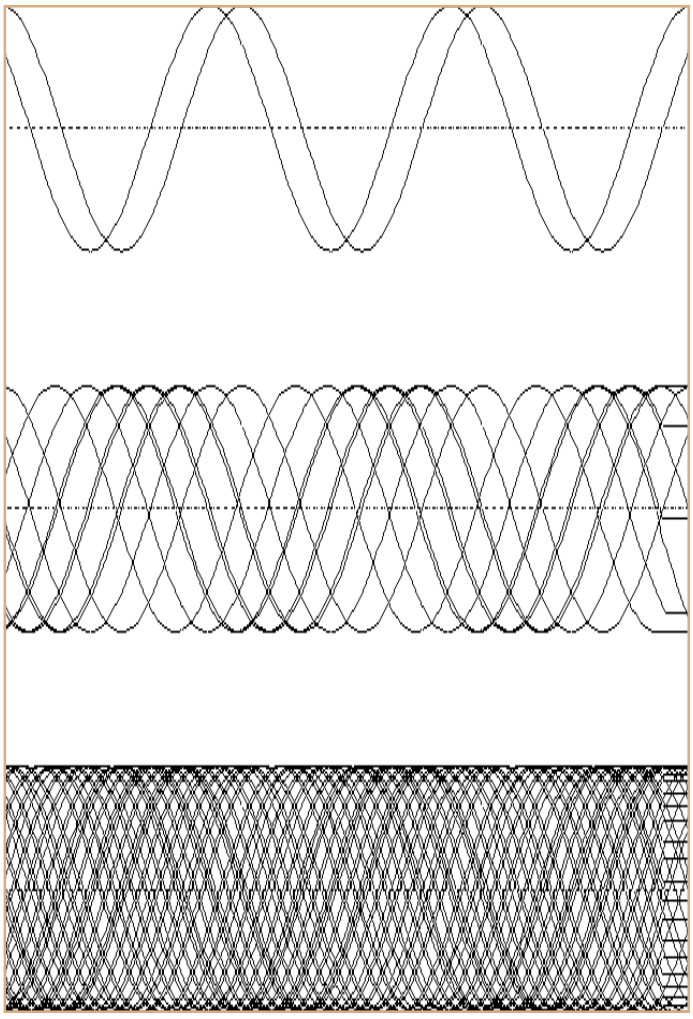
Diamond Power recommends installing the PHM device whenever high performance sootblower nozzles are used or in any application to improve blower coverage and minimize the potential erosive effects of sootblower cleaning.

User Benefits:

- Improves cleaning
- Reduces tube erosion; in many cases eliminating the need for tube shields
- Prolongs lance tube life:
  - Combats lance tube sagging
  - Reduces lance inside diameter corrosion
  - Prevents lance outside diameter build-up
  - Distributes lance-roller wear over full lance surface

Effectiveness of the Progressive Helix Mechanism device:

The sketches below illustrate the effectiveness of the PHM in providing a precisely indexed nozzle-cleaning path across the face of a boiler tube bank. Although each lance tube is fitted with two or more nozzles, the path followed by only a single nozzle is shown after 1, 5 and 20 cycles. The cleaning paths are spread evenly across the cleaning surface with the precise indexing provided by this geared mechanism. The lance translates forward without rotation, exactly one gear tooth, each time the sootblower starts a cycle. This even distribution of the indexed cleaning paths occurs right from the start of and throughout hundreds of cycles that occur before the nozzle paths repeat themselves exactly.



Trace after one sootblower cycle
Nozzle path traced out after one sootblower cycle (only one of two nozzles shown for clarity)

Trace of a single nozzle after five cycles with PHM

Trace of a single nozzle after 20 cycles with PHM

The cleaning path of nozzle not shown bisects the helical path of the one shown for each cycle traced on these figures.

Specification Statement:

"Equipment will provide a defined shift in the cleaning pattern every operational cycle without the use of clutches or similar devices. Diamond Power Progressive Helix Mechanism device or equivalent is required."

For engineered solutions to your specific boiler cleaning needs, contact your local Diamond Power representative or our main office at:
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