TECHNI/TIPS

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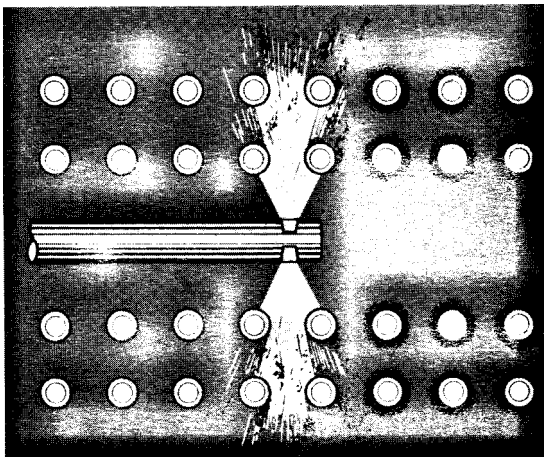
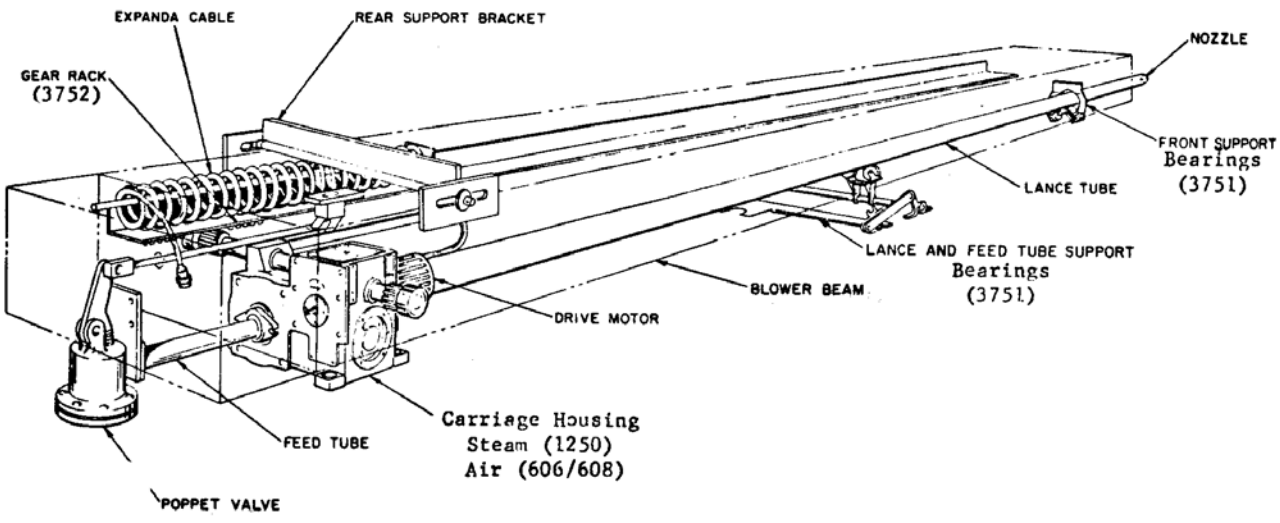
SOOT BLOWERS AND OTHER BOILER CLEANING EQUIPMENT

A common application at oil, coal or multi-fuel source power plants is retractable or rotary soot blowers, used to clean heating surfaces of boilers fired with ash producing fuels. Several soot blowers are usually found on each level of the boiler tower. Electric power generation plants will generally have dozens of soot blowers in operation. Soot blowers function to keep combustion particles from sticking to boiler tube banks within the boiler tower. The basic principle of the soot blower is the cleaning of heating surfaces by multiple impacts of high pressure air, steam or water from opposing nozzle orifices at the end of a translating-rotating tube. A traveling lance with nozzle jets penetrates the narrow openings in the boiler tube banks to blast the tubes clean. The tubes must be kept clean to allow optimum boiler output and efficiency.

Air, saturated or superheated steam, or water-or any combination of these may be used as the blowing medium, and with nozzle adjustment pressure up to 425 psig. Both retractable and/or rotary blowers may be used, with the retractable units predominating.



Some retractable soot blowers travel up to 25 ft. into the boiler tube bank. A rotary lance, with right-angle nozzles, allows highly effective cleaning patterns in closely spaced tube banks. Where widely spaced tube platens are used, staggered and angled leading and trailing edge nozzle patterns are used to properly direct jet actions.

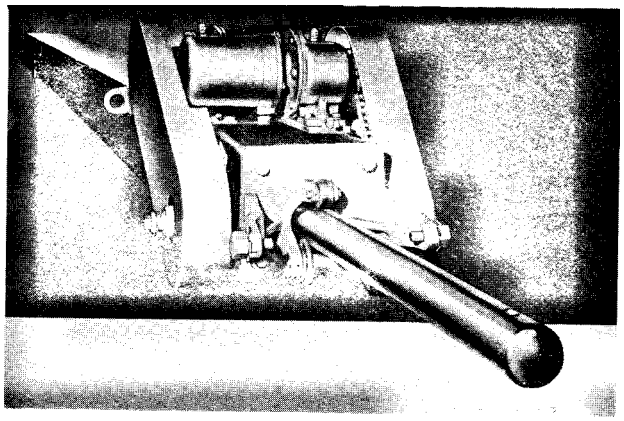


All are ruggedly built, to operate dependably on both indoor and outdoor boiler tower installations. Swirling of the blowing medium gives maximum cooling effect on the lance, which lends to long service life in almost any furnace temperature.

A traveling carriage rotates and directs the lance on soot blowers. Some models are driven by flexible, removable link chain, avoiding the need of troublesome drive shafts, racks and pinions. Dual side roller supports eliminate carriage swing and increase load capacity. High speed gear trains and controls are mounted away from the hot boiler walls and the path of the blowing medium. Positive mechanical action of rugged cam and linkage open and lock the blowing medium valve as the lance extends and closes it as the lance retracts.

Many blowers are built with heavy gauge steel housings, which allow catwalks to be hung directly from them, thereby helping to cut installation costs. One motor moves the blowing lance into and out of the boiler tube banks, while another motor rotates the lance. Rotation is continuous, from the start until complete retraction, with no stop-step at the outer end of travel, allowing return travel of the nozzles over a different pattern. This provides optimum cleaning.

The primary elements of the typical soot blower should be: (1) A nozzle-especially selected for each application. (2) A means to convey the nozzle-conveying mechanism includes the lance tube, carriage and drive motor. (3) A means to supply blowing medium into the nozzle-poppet valve, feed tube, packing gland and lance tube. (4) A means to sup-port and contain the lower component -- a canopy type beam with a two-point suspension. (5) Con-trols-integral components protected by the beam to control the blowing cycle and supply power to the drive motor.



The typical blower operation begins with the blower in the retracted position. When power is supplied to the drive motor, it will move the carriage along guide rails or rollers located on each side of a beam to project the lance tube into the boiler. When the nozzles in the lance start entry into the boiler, the carriage will trip the blowing medium valve to begin the cleaning cycle. The carriage will continue to translate and rotate the lance tube through the boiler tube banks until it reaches the extreme extended travel. At this point, the carriage will immediately reverse its direction and at the same time index the lance tube to return on a different nozzle path. The carriage will continue to retract until the nozzle reaches the boiler wall, at which point the blowing medium is shut off. The carriage then continues to the extreme retracted position.

The ash producing fuels, used to fire the boilers at electric generating stations, cause a build-up of combustion by-products on other heating surfaces of the boiler, including ash and slag on the walls, screens, superheaters, reheaters and economizers. Equipment used, other than retractable or rotary soot blowers, are retractable water deslaggers, gunblowers and water wall deslaggers, air heater cleaners and furnace probes. Except for the probes, all the equipment helps clean the tubes and other furnace surfaces of soot, slag, etc.

LE lubricants are the choice for dependable protection of all the probes, cleaners, deslaggers and soot blowers operated by electric generating stations firing their boilers with ash producing fuels. One of the largest manufacturers of a complete line of such equipment, factory fills certain application points on some of their equipment with LE's 1250 ALMASOL High Temperature Lubricant.

Only the finest ingredients, plus LE's proprietary wear-reducing additives ALMASOL® and MONOLEC® are used in manufacturing lubricants to protect these critical operations. Many of these premium products, coupled with the services of a corps of trained LE Sales Representatives and supported by a highly qualified Technical Services Department, are protecting a great number of generating stations throughout the nation. All these services have made LE one of the best known and most trusted suppliers of quality lubricants in the power generation market.

The following are general recommendations of LE lubricants for equipment typical to that discussed here, but always confirm the specifications of the specific equipment being used.

AIR HEATER CLEANERS

Linkage Fittings:	1275 ALMAPLEX Industrial Lubricant 3751 ALMAGARD Vari-Purpose Lubricant
Gearbox Oil Reservoir:	606 ALMASOL Vari-Purpose Gear Lubricant
Adapter Gearings Grease Reservoir:	4700 MONOLEC Industrial Lubricant

FURNACE PROBES

Power Pack Gearbox Oil Reservoir:	6403 MONOLEC Turbine Oil 6803 MULTILEC Industrial Oil

RETRACTABLE SOOT BLOWERS

Traveling Carriage Gearbox-	
Steam Blowing:	1250 ALMASOL High Temperature Lubricant 1275 ALMAPLEX Industrial Lubricant 5182 PYROSHIELD 9901 ALMASOL SYNTEMP Lubricant
Air Blowing:	
Inside Installation --	608 ALMASOL Vari-Purpose Gear Lubricant
Outside Installation --	606 ALMASOL Vari-Purpose Gear Lubricant
Air Motor Air Line Lubricator:	6401 MONOLEC Turbine Oil 6801 MULTILEC Industrial Oil
Revolving Roller Assembly Fittings:	1275 ALMAPLEX Industrial Lubricant 3751 ALMAGARD Vari-Purpose Lubricant
Traversing & Rotary Gearboxes --	
Oil Reservoirs:	
Inside Installation --	608 ALMASOL Vari-Purpose Gear Lubricant
Outside Installation --	606 ALMASOL Vari-Purpose Gear Lubricant
Lance Bearing Fittings:	1275 ALMAPLEX Industrial Lubricant 3751 ALMAGARD Vari-Purpose Lubricant
Main Gearbox Grease Reservoir:	4700 MONOLEC Industrial Lubricant
Power Pack Gearbox Reservoir:	6403 MONOLEC Turbine Oil 6803 MULTILEC Industrial Oil
Motor Adapters --	
Grease Reservoir:	
Electric --	4700 MONOLEC Industrial Lubricant
Air --	1275 ALMAPLEX Industrial Lubricant 3751 ALMAGARD Vari-Purpose Lubricant

ROTARY BLOWERS

Air Motor Air Line Lubricator:	6401 MONOLEC Turbine Oil 6801 MULTILEC Industrial Oil
Power Pack Gearbox Reservoir:	6403 MONOLEC Turbine Oil 6803 MULTILEC Industrial Oil
Cam Follower Fittings:	1275 ALMAPLEX Industrial Lubricant 3751 ALMAGARD Vari-Purpose Lubricant
Reaction Plate Bearing Fittings:	1275 ALMAPLEX Industrial Lubricant 3751 ALMAGARD Vari-Purpose Lubricant
Miscellaneous Linkage Hand Oiled:	6403 MONOLEC Turbine Oil 6803 MULTILEC Industrial Oil
Power Pack Oil Reservoir:	606 ALMASOL Vari-Purpose Gear Lubricant
Switch Gears Grease Reservoir:	1275 ALMAPLEX Industrial Lubricant 3751 ALMAGARD Vari-Purpose Lubricant

RETRACTABLE WATER DESLAGGERS

Traveling Carriage Gear Case Reservoir:	1250 ALMASOL High Temperature Lubricant 1275 ALMAPLEX Industrial Lubricant 5182 PYROSHIELD 9901 ALMASOL SYNTEMP Lubricant

GUNBLOWERS & WATER WALL DESLAGGERS

Linkage Grease Fittings:	1275 ALMAPLEX Industrial Lubricant 3751 ALMAGARD Vari-Purpose Lubricant
Rack Housing (Electrical) Reservoir:	608 ALMASOL Vari-Purpose Gear Lubricant
Air Motor Air Line Lubricator:	6401 MONOLEC Turbine Oil 6801 MULTILEC Industrial Oil
Rotary Gearbox:	
Electric --	608 ALMASOL Vari-Purpose Gear Lubricant
Air --	4700 MONOLEC Industrial Lubricant

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