

**STANDARD V AND FLAT
TABLE WAYS**
Hydraulic Above — Hand Below

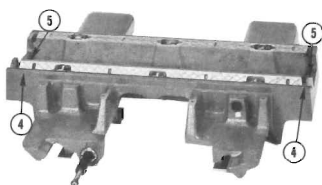


PHOTO 2

LUBRICATION

I. INITIAL

K. O. Lee grinders are made with a variety of lubrication systems, but the standard design features a self-lubrication principal of spool rollers working in lube reservoirs (photo 2). Ways are kept wet and clean by movement action of the saddle and table. Check all machine-way surfaces for wetness of oil by traversing the saddle and table. Standard machines are shipped with an adequate supply of way lube in the lubrication system, as are machines with one-shot or electrically powered lubrication. Column-way surfaces, nut, and screw are covered with preservative oil. The B6000 series grinders have a built-in reservoir for light way lube for the column screw and nut.

Hydraulic machines are not shipped with hydraulic oil, but base-ways and column-ways are lubricated by spool rollers or other systems. Note that all "V" way ends have a nylon spring loaded plug to wipe way oil from corresponding saddle or table "V" as shown in photo above. Extra way-lube oil is sent with the machine in a separate container.

II. HYDRAULICALLY POWERED MACHINES

The "Instruction Manual, Hydraulic Parts List, Coolant Parts List" (HPL-3) which comes with the machines discusses set-up and maintenance of the hydraulic system.

Consult Lube Chart, page 5 for remaining points on lubrication of hydraulic models.

The main item of concern is to keep the longitudinal table ways wet with clean oil

from the hydraulic system. Valve No. 18 pictured on the Hydraulic Pump and Tank Assembly, shown in Photo 5, is used to regulate the flow of oil and has been properly set at the factory for the correct grade of oil at normal operating temperature.

BALL-TRACK TABLE/SADDLE END VIEW

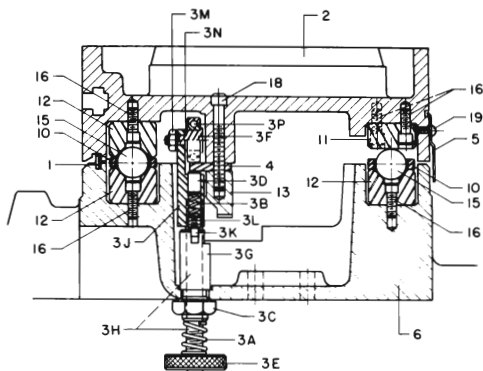


PHOTO OF TOP OF BALL-TRACK SADDLE



III. BALL-TRACK HYDRAULICALLY POWERED MACHINES OR MACHINES WITH PRESSURE LUBRICATION SYSTEM

- A. These models have special piping to the center of the "V"-ways, and receive regular amounts of oil or way lube from the hydraulic system or power way lube system. Periodic inspection is advisable and may be done in the following manner.
- B. It is necessary to disengage the piston rod from the table at the right end of the table. Remove the thumb nut, move the table slightly further to the right, and remove the collar from the piston rod (reach under the table end to locate on rod). Move the table to the extreme right until the saddle table way reservoirs

become visible. The level of lubrication should be maintained at the top of the overflow, cut-out section of the saddle extension casting. With hydraulic machines, the level of way lube is approximately $\frac{3}{4}$ " deep from the bottom. If the level appears to be low, adjust oil flow valve for the ways, (Part No. BA931W, Index No. 18, page 7) on hydraulic tank for increased flow to table reservoirs. Similarly, attempt to determine if pressure lubrication system (one-hot, automatic one-shot, etc.) is putting out the proper amount of way lube. Adjust as necessary.

SUGGESTED INSPECTION AND CLEANING SCHEDULE

Monthly:

- A. Ways should be inspected at least once per month if the machine is in continuous use.
- B. Clean the bottom of the hardened TABLE "V" and flat ways, at least once per week by moving the table to the extreme ends of its travel, left and right, and wiping the ways with a clean cloth.

Yearly:

- A. Clean out the hollow SADDLE EXTENSIONS on each side of the table. Move the table to one end and then the other, uncovering these extension areas. These hollow extensions will accumulate some dirt and oil drippings from the ways, and need to be cleaned periodically. Extensions are drained back into the saddle on hydraulic models.
- B. Remove the table from the saddle by removing the hand nut (Index No. 3E) from the table roller hold-down tension rod end (Index No. 3H), under the saddle, by counterclockwise turns. Be careful to disattach all items attached to the table, such as coolant guards and the hydraulic piston rod. Remove the tensioning spring and lift the table straight upward until the hold-down rod clears the saddle sleeve hole. NOTE: Because of the nylon tensioning plugs, the entire assembly will hang onto the gear rack steel hold down bar (Index 4, page 2). Set the table on its side and inspect its ways for wear. Inspect the hardened ways and balls in the saddle for signs of wear. Clean out the saddle table and balls. Clean out the saddle table way reservoirs. Replace with clean oil or way lube, and replace the table back onto the saddle by reversing the steps just taken to remove the table. Tighten the hand nut of the table roller hold-down assembly until the spring is fully compressed, and then loosen it by approximately $\frac{3}{4}$ of a turn.

IV. LUBRICATION CHART

Refer to the number in Photo 3, and follow the Instructions and Specifications in the chart.

Instruction Manual

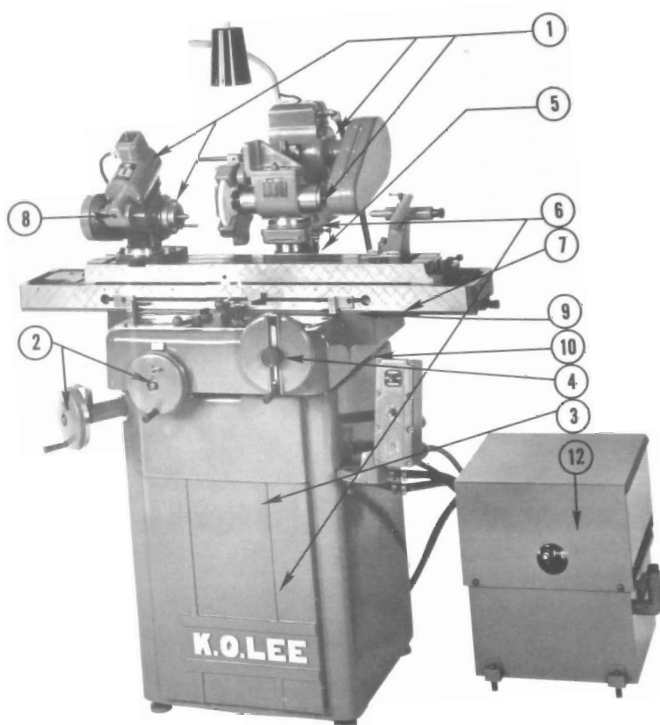


PHOTO 3

LUBRICATION INSTRUCTIONS AND SPECIFICATIONS

Station Numbers	Parts Lubricated	Machine Model	When To Oil	Procedure	Lubricant Specification
1	Motor and spindle bearings; dead center for workheads, and all workheads with ball bearings	All Models		None	Factory grease-packed for life of bearings
2	Crossfeed and elevating shaft(s) bearings				
3	Elevating gears	B300 Series BA900, B2000, B6000 Series	Every 6 Months	Service by removing rear plate or thru front cabinet door — Clean and repack. Service by entry thru front cabinet door.	Grease, calcium base 340 viscosity
4	Transmission for table	All models	Check Yearly	Remove filler plug screw and fill to 1/2" from top.	Factory sealed with 600W Cylinder Oil
5	Column O.D.	BA900, B300, B2000 Series B6000 Series	Yearly Monthly	Slip down column boot, wipe O.D. with oiled cloth. Fill through oil cup on column housing.	Light way lube
6	Column screw and nut	B300, BA900, B2000 Series	Every 6 Months to 1 Year	Remove grinding head; remove column cap; brush screw with lube.	Light way lube
	Column screw and nut	B6000 Series	Yearly	Column has built-in reservoir with wick. Fill thru center hex hole in pivot stud under dovetail slide — 1/2 pint capacity.	Light way lube
7	Gear rack	All models	Monthly	Brush clean, oil by moving table to extremes — either direction.	Clinging grease or way lube
8	Gear reduction drive	All motorized workhead models	Check Yearly	Fill through screw plug up to bottom of filler hole.	600W cylinder oil
9	Table Saddle Ways (See photo 2)	B300, BA900, B2000, B6000 Series Std. 'V' and Flat Ways	Every 1 to 6 months depending on usage	Ways are roller lubricated. Remove table, clean reservoirs, fill with lube. Feel ways; they must run wet.	Light clinging way lube
	(See photo 2)	Ball Track Models BA900B, B2000B, B6000B Series	Monthly	See page 3, III for table removal.	2671 Extra Light Way Lube Only
	Table Saddle Ways (See Photo 2)	All hydraulic models	Check Every 6 Months	No way lube required. Ways are self-lubricated from hydraulic system. See page 18, II.	Hydraulic oil
	Table saddle ways, base ways, feed screw and nut	Optional One-Shot Lube — All Models	See Instruction on Machine	Pull plunger as per machine instruction. Electric units — self timed.	Light clinging way lube
10	Base saddle ways (See (3) photo 2)	All Standard Models All Hydraulic Models	Every 6 Months to 1 Year	Move table to extreme right and left exposing oil reservoir tubes in saddle. Pour oil into tubes (see (5) photo 2) until oil runs from either end of V-ways. On B300 Series, move saddle to extreme outward position, fill reservoir through tubes; return saddle to extreme inward position; repeat filling procedure. NOTE: If base ways are very dirty, remove saddle by removing bolts holding saddle feed bar (from underneath base top), that holds the bronze crossfeed nut in position. Slide saddle front; remove. Clean channel ways; fill to bottom of 'V'; keep nylon plugs in way ends.	Light way lube Each way holds approximately 1 pint
27 Photo 4	Motor and pump	Coolant Attachment — All Models		None	Factory grease-sealed
12	Hydraulic pump motor	All Hydraulic Models		Check motor, add oil as directed, or yearly.	Motor Oil, S.A.E. No. 10