

THRUST BEARING

The thrust bearing shown in Figure 1 is of the Kingsbury leveling block type, which automatically distributes the load equally among the various shoes. These shoes are supported on the leveling blocks "16", "17", "18" and "19", which by means of their rocking motion, allow the shoes to take a position so that the babbitted faces are all in the same vertical plane. Consequently, each shoe takes an equal share of the load. This construction eliminates the necessity of having all the shoes of exactly the same thickness. By a cumulative shifting of the leveling blocks the thrust shoe load is also uniformly distributed in case the shaft carrying the collar is not exactly parallel to the bore of the housing.

The thrust of the rotor is transmitted to the shoes by means of a steel collar which is machined integrally with the stub shaft which is bolted to the end of the rotor shaft. The main illustration, Section C-C-C-C, shows a full complement of shoes on each side of the collar to carry the thrust in either direction.

Referring to Section C-C-C-C, the shoes and leveling blocks are carried in the bearing cage consisting of Items "1", "2", "8" and "10". These parts are bolted together solidly to form the completed cage, which in turn, is prevented from rotating by means of the thrust bearing housing cover.

The axial position of the cage is determined by the stops, consisting of slides "26", wedges "27" and shims "28". The stop wedges can be moved inward or outward by means of the adjusting screws "25", to obtain the correct axial setting of the cage, and hence the rotor within the cylinder. One full turn of the adjusting screw changes the axial clearances within the turbine cylinder 10 mils, (.010 inch). When making an adjustment, the adjusting screws of both sides of the cage must be changed the same amount. Also, with the pair of wedges on one end of the cage set to give the correct axial position of the rotor, the pair of wedges on the other end must be set in tightly to prevent axial movement of the cage within the housing. This construction of adjustable stops is merely to facilitate the work of dismantling, assembly, etc., during installation and repair periods. In normal operation these adjusting screws "25" must not be moved under any circumstances.

Dismantling and Assembling

The entire thrust bearing can be dismantled without removing the rotor or stub shaft. By removing the dowel screws "3" which hold the upper and lower halves of the cage together, both halves can be removed. The shoes are loosely fastened in the cage halves and will not drop out when these parts are lifted. However, when reassembling, the shoes and leveling blocks which are adjacent to the horizontal joint should be packed with a heavy grease in order to prevent these blocks from falling out of position. Otherwise there is danger of the blocks and shoes locking so that there is no flexibility with resulting possible overloading of two or more shoes.

Adjustments

The total axial clearance in this bearing should be between 10 and 15 mils, (.010 and .015 inch). To check this, the bearing cage should first be completely assembled. The liners "9" should then be removed and the vertical joint bolts pulled up evenly. The thrust shoes will then be clamped against the collar with a fair degree of tightness. The space left vacant by the liners "9" should be measured accurately with feeler gauges. This reading, plus the clearance of 10 to 15 mils, is the thickness of liners

Thrust Bearing

which should be inserted in order to obtain the correct running clearance. After assembling in this manner, and with the cage locked in position (by means of the stops "27") so that no lost motion occurs, the clearance should be checked by rolling the rotor and moving it from one extreme axial position to the other, and measuring the end travel with a dial type indicator.

The stop wedges "27" which determine the axial position of the thrust bearing cage should be adjusted as follows:

- a. Adjust the axial position of the thrust bearing cage so that the rotor is in its correct position to give the blade and labyrinth seal clearances specified on the rotor clearance drawing.

Note: Be sure that the clearance between the thrust collar and the shoes is on the same side of the collar as shown on the drawing.

- b. Then screw the stop screws inward until the wedges are tight against the cage lugs so as to anchor the cage in this position and eliminate end play of the cage within the housing. If the screws do not give the desired setting, adjust the liners "28" accordingly.

Lubrication

The bearing is flooded with oil under pressure at all times. This oil is supplied directly from the main bearing supply line. The passages and directions of flow are shown in the Figure by arrows. As the thrust collar rotates with reference to the shoes the film of oil between each shoe and the loaded collar will tend to take a wedge-like shape with the thick side of the wedge on the forward (or entering) edge of the shoes. Thus the oil is carried between the bearing surfaces by the motion of the collar and assures proper lubrication of these surfaces. The amount of oil flowing through this bearing is determined by the size of an orifice installed in the oil discharge line.

The following list has been compiled to facilitate ordering spare or renewal parts by item number and name, together with the serial number of the turbine.

<u>Item No.</u>	<u>Name</u>	<u>Item No.</u>	<u>Name</u>
1	Cage (Outer End Upper Half)	16	Leveling Block (Outer)
2	Cage (Inner End Upper Half)	17	Leveling Block (Outer) (Slotted for Stop Key)
3	Cage Screws (Horizontal Joint)	18	Leveling Block (Inner)
6	Cage Seal Ring Complete (Inner)	19	Leveling Block (Inner) (Slotted for Stop Key)
7	Cage Packing Ring	20	Shoe Disc Seat
8	Cage (Inner End Lower Half)	21	Shoe Disc
9	Cage Adjusting Liners	22	Shoe
10	Cage (Outer End Lower Half)	23	Cage Stop Dowel Lock Screw
11	Cage Seal Ring Complete (Outer)	24	Cage Stop Dowel
12	Leveling Block Stop Key	25	Cage Stop Adjusting Screw
13	Cage Stud Bolt (Fitted) (Vertical Joint)	26	Cage Stop Slide
14	Cage Stud Bolt (Vertical Joint)	27	Cage Stop Wedge
15	Leveling Block Pin	28	Cage Stop Wedge Liners

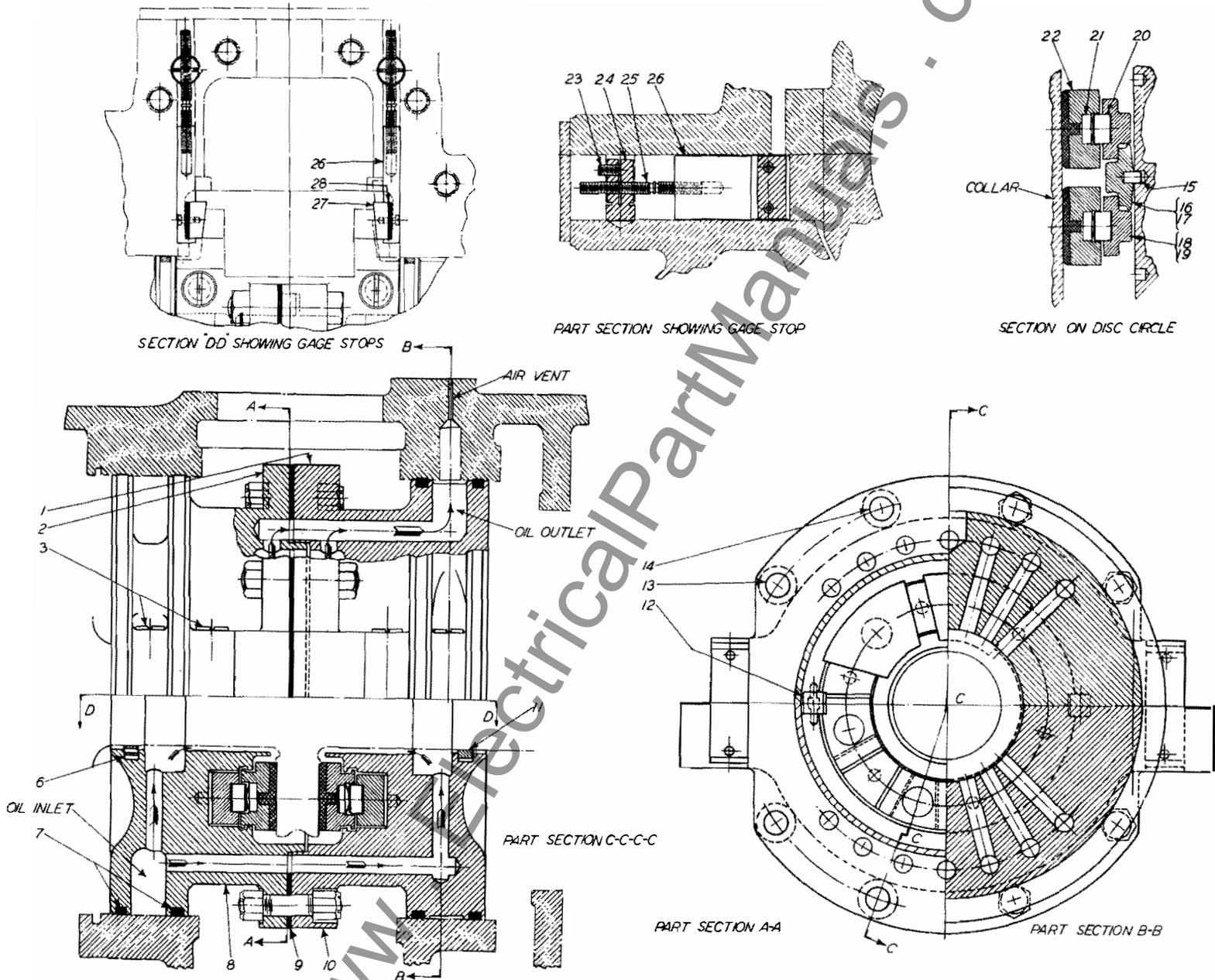


Figure 1