Volume 2, Issue 5, May 2024 **ISSN (E):** 2938-3757

REPAIR AND REFURBISHMENT OF PLAIN BEARINGS

Тилавалдиев Бахтияр Тилавалдивиевич,
старший преподаватель, Ферганский
политехнический институт, г.Фергана, Узбекистан.
E-mail: bahtiyar57@mail.ru

Abstract
This article discusses the main work performed on the maintenance, restoration and repair of emerging malfunctions of plain bearings. Wear of the rubbing surfaces of plain bearings causes their geometric shape to be disturbed and marks and scuffs appear; the bore becomes oval. Wear is sometimes so great that the lubrication grooves of the bearings almost lose their outlines, and it becomes impossible to adjust the interference to compensate for wear.

Keywords: plain bearings, holes, geometric shape, wear, lubrication grooves, adjustment, liner, mechanically, pouring mold, set of gaskets.

Introduction

In the process of operation, the geometric shape of the rubbing surfaces of plain bearings is broken. Defects in the liners are detected by external inspection and by the sound when tapping with a hammer: the liner with a peeled babbitt layer emits rattling and dull sounds, and the liner with a well-preserved filling makes clear and sonorous sounds. Cracks in the babbitt are detected by immersing the liner in kerosene for 10-15 minutes. therefore, they are clearly outlined on chalk-painted surfaces after they have dried.

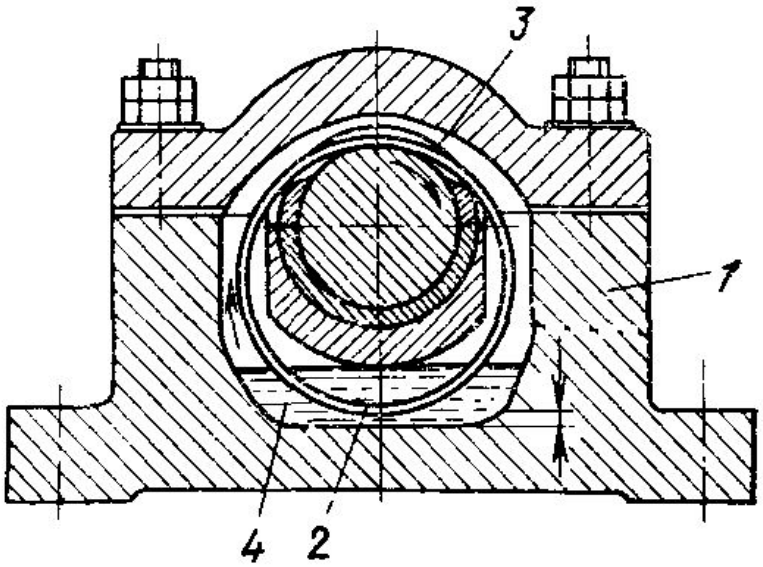

Figure – Plain bearing
1 – bearing housing; 2 – oil supply ring;
3 – cutout in the upper liner; 4 – oil.

Web of Technology: Multidimensional Research Journal
webofjournals.com/index.php/4

When the wear of the rubbing surfaces reaches the maximum permissible value, the shaft and bearing are repaired (the shaft is polished, and the bearing is restored to the correct geometric shape).

Split plain bearings are restored by scraping or re-pouring the liners.

If the wear is not great, then scraping is performed. Scraping is carried out by scraping irregularities from the surface of the babbitt fill.

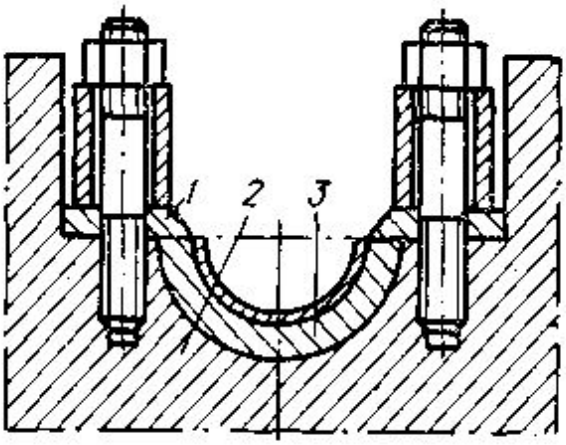

Figure – Attaching the bearing liner to the scraping bed
1 – clamp; 2 – bed; 3 – liner

In case of significant wear of the liners or delamination of the babbitt, they are re-poured.

When restoring babbitt liners, it is necessary to remove the old layer of babbitt. For this purpose, the liners are heated to a temperature of 250 – 300 ° C. Heating is carried out from the back of the liner to reduce the process of intergranular corrosion of babbitt. After removing the old babbitt, the inner surface of the liner is carefully cleaned mechanically and etched in a 10-15% solution of sulfuric acid or in a 50% solution of hydrochloric acid, then washed with warm water and degreased with an 80% solution of caustic soda, followed by washing and drying.

To obtain a high-quality pouring of babbitt, the surfaces of the liner are tinned with pure tin or tertiary (70% lead and 30% tin), as a result of which the surface of the liner should have a clean shiny appearance.

After tinning, the liners are assembled in a pouring mold, heated to 200 – 250 °C and poured with babbitt at a strictly defined temperature.

Bearings are poured manually or centrifugal in a special mold.

With the manual method, it is possible to simultaneously pour two halves of the bearing assembly or each half separately. Before pouring, the liner is heated on a steel sheet to a temperature of 180 – 200 °C. Molten babbitt, the volume of which is slightly larger than the volume of pouring, is superheated by 25 – 50 °C above the melting point and is quickly poured in a continuous stream. After pouring, the surface of the babbitt is pierced with a red-hot steel rod to allow the gas to escape.

In centrifugal pouring, both liners are installed on special machines or fixtures. Babbitt is poured by rotating the liners. Centrifugal pouring reduces the gas filling of the layer.

Web of Technology: Multidimensional Research Journal
webofjournals.com/index.php/4

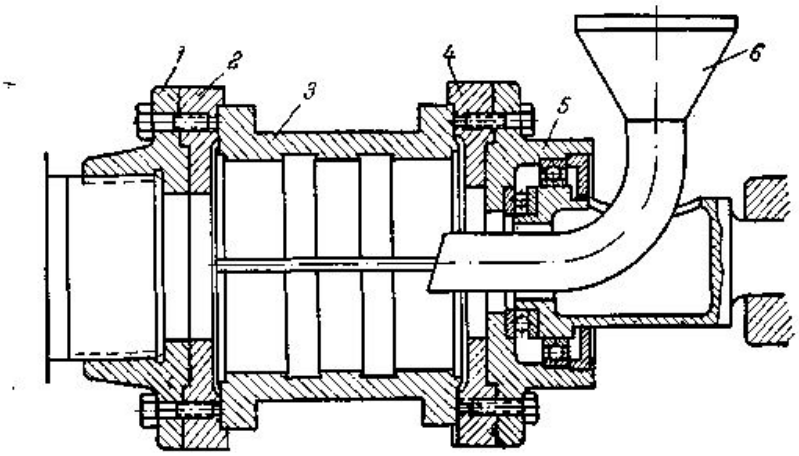

Figure – Device for centrifugal pouring of bearing shells
1 – fastening platter; 2 – end cover; 3 – liner;
4 – back cover; 5 – drum; 6 – filling hopper.

After cooling, the bearings are inspected. Their surface should have an even silver color. The tightness of the babbitt's adhesion to the bearing surface is checked by tapping with a hammer.

In the poured liners, lubrication grooves are milled, lubrication holes are drilled, then scraping is carried out.

For plain bearings, interference is created by installing gaskets at the parting points of the liners. Adjustment of the interface between the shaft journal and the liner is made by changing the thickness of the gaskets by scraping. A set of gaskets is completed from plates with a thickness of 0.05....2 mm with the following intervals: 0.05-0.1-0.2-0.3-0.5-1 mm.

Bearings with little wear are repaired by scraping, if this is enough to create interference without gaskets. The neck of the shaft or spindle is then evenly covered with a thin layer of paint and the part is laid with the painted neck on the lower liner. Scraping is carried out according to paint prints, changing the direction of the doctor with each new pass.

Upon completion of the repair of the bearings, their nuts are tightened alternately in a criss-cross sequence, gradually increasing the tightening force.

References

1. Tilavaldiev, B. T. (2022). Angle and cone of friction. Economics and Society, (4-3 (95)), 398-403.
2. Ergashev, N., & Tilavaldiev, B. (2021). Hydrodynamics of Wet Type Dusty Gas Collector. International Journal of Innovative Analyses and Emerging Technology, 1(5), 75-86.
3. Matkarimov, A. A., & Tilavaldiev, B. T. (2021). Prospects for the development of mechanical engineering in Uzbekistan. Theory and Practice of Modern Science, (1), 244-247.
4. Tilavaldiev, B. T., & Rakhmonov, A. T. U. (2021). Seismic Risk Assessments of the Territory of the Cities of the Republic of Uzbekistan. Oriental renaissance: Innovative, educational, natural and social sciences, 1(10), 143-152.

Web of Technology: Multidimensional Research Journal
webofjournals.com/index.php/4

5. Tilavaldiev, B. T., & Abdullaev, Z. D. (2021). Information and communication management technologies in emergency situations. Universum: Technical Sciences, (11-1 (92)), 31-33.
6. Tilavaldiev, B. T. (2022). The history of the appearance of threaded connections. European Journal of Interdisciplinary Research and Development, 9, 137-140.
7. Tilavaldiev, B. T. (2022). Determination of torque force T1 in belt drive legs. Periodica Journal of Modern Philosophy, Social Sciences and Humanities, 12, 230-234.
8. Tilavaldiev, B. (2022). Grip and Sliding Friction Processes. Eurasian Journal of Engineering and Technology, 13, 15-18.
9. Tilavaldiev, B. (2022). Methods for Reducing Vibratility and Increased Gear Durability. Eurasian Research Bulletin, 15, 38-40.
10. Tilavaldiev, B. (2022). METHODS OF MANUFACTURING GEARS. International Journal of Advance Scientific Research, 2(11), 127-130.
11. Tilavaldiev, B. T. (2022). PRODUCTION WASTE IN MECHANICAL ENGINEERING. PEDAGOGS jurnali, 21(1), 4-8.
12. Tilavaldiev, B. T. (2023). PROTECTION OF WALLS OF BUILDINGS, STRUCTURES AND HOUSES FROM MOISTURE. Journal of new century innovations, 23(1), 158-162.
13. Tilavaldiev, B. T. (2023). CONSTRUCTION OF A DIAGRAM OF CAM MECHANISMS. Journal of new century innovations, 23(1), 168-172.
14. Tilavaldiev, B. T. (2023). THE USE OF NATURAL AND ARTIFICIAL BUILDING MATERIALS IN THE CONSTRUCTION OF INDIVIDUAL HOUSES. Journal of new century innovations, 23(1), 163-167.

Web of Technology: Multidimensional Research Journal
webofjournals.com/index.php/4