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## LABORATORY WORK SHEET

Date: .....

Roll No: 22955A0305 Name: E. Girish chandra

Exp No: 05 Experiment Name: Journal bearing apparatus

**DAY TO DAY EVALUATION:**

| | Preparation | Algorithm / Performance in the Laboratory | Source Code / Calculations and Graphs | Program Execution / Results and Error Analysis | Viva voce | Total |
|---|---|---|---|---|---|---|
| Max. Marks | 5 | 5 | 10 | 5 | 5 | 30 |
| Obtained | 4 | 4 | 4 | 3 | 3 | 18 |

Signature of Lab I/C

**START WRITING FROM HERE:**

Aim: To determine the, pressure, distribution in a journal bearing.

Specification:

1) Diameter of journal (A) = 2R = 55mm
2) Diameter of bearing (2) = 2r = 70mm
3) Bearing width (L) = 15m
4) weight of bearing with attachment = 1.7kg
5) Weight of balancing rod
6) motor DC = 0.5HP, 1500rpm variable speed
7) set of weight is provided
8) dimmer state is provided for speed variation
9) manometer board with 16 tubes with suitable scales and oil tank.
10) SAE - 20 lubricating oil

Apparatus: Journal bearing apparatus.

Typical result with respective to manometer table:

| S.No | Head | Load = 100grms, 625rpm Dimmer | No Load, 800rpm dimmer |
|---|---|---|---|
| 1 | $P_1$ | 129 - 52 = 77 | 128.5 - 52 = 78.5 |
| 2 | $P_2$ | 123.5 - 52 = 77.5 | 122 - 52 = 70 |
| 3 | $P_3$ | 107.7 - 52 = 55 | 107.5 - 52 = 55.5 |
| 4 | $P_4$ | 81 - 52 = 29 | 82.5 - 52 = 30.5 |
| 5 | $P_5$ | 55 - 52 = 3 | 39.5 - 52 = -13.5 |
| 6 | $P_6$ | 37.5 - 52 = -17.5 | 16.5 - 52 = -33.5 |
| 7 | $P_7$ | 38 - 52 = -14 | 36.5 - 52 = -45.5 |
| 8 | $P_8$ | 6.5 - 52 = -45.5 | 114 - 52 = 62 |
| 9 | $P_9$ | 119 - 52 = 68 | 116.5 - 52 = 64.5 |
| 10 | $P_{10}$ | 14 - 52 = -38 | 135.5 - 52 = 71.5 |
| 11 | $P_{11}$ | 120 - 52 = 68 | 125 - 52 = 73 |
| 12 | $P_{12}$ | 138 - 52 = 86 | 123.5 - 52 = 71.5 |
| 13 | $P_{13}$ | 125 - 52 = 88 | 125 - 52 = 73 |
| 14 | $P_{14}$ | 123 - 52 = 71 | 125 - 52 = 73 |
| 15 | $P_{15}$ | 122 - 52 = 105 | 121.5 - 52 = 69.5 |
| 16 | $P_{16}$ | 131 - 54 = 79 | 131 - 52 = 79 |
| | | | |

Procedure:

1) fill the oil tank with SAE20 (or) SAE50 lubricants.
2) Drain the air from all the manometer tubes.
3) check the apparatus for any leakage and makes same leakage is there in the apparatus for cooling purpose.
4) Check direction of rotation of motor and gradually increase its speed
5) Let the Journal bearing run for half an hour oil in bearing is warmed up and check steady oil at various tapping
6) All the measured loads and keep the balancing rod in horizontal position by moving balancing weight 'W' and observe steady levels.
7) when the lubricating oil in the manometer bar down take pressure reading of manetic tube (1-12) and (AD)
8) Repeat experiment on various speed and loads.

Graph:

1. Graph of the plotted for pressure head of oil above supply head in cm of oil at angular intervels of 30° of oil film
2. Graph is draw for theorical experiment pressure curve for Interval points.

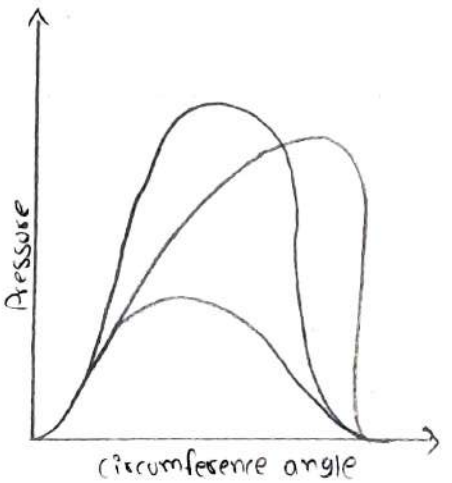

Table-2 Pressure head oil head ($P_1$ $P_3$) in cm

| S.No | Head | Load - 220g, 1050rpm Dimmes - 120 | No load 1080rpm Dimmes -120 |
|---|---|---|---|
| 1 | $P_1$ | 131 - 52 = 79 | 129-52 = 77 |
| 2 | $P_2$ | 125 - 52 = 73 | 122.5 -52 = 70.5 |
| 3 | $P_3$ | 115 - 52 = 63 | 116 -52 = 64 |
| 4 | $P_4$ | 84.5 - 52 = 63.5 | 85.5 - 52 = 38.5 |
| 5 | $P_5$ | 56 - 52 = 4 | 59.5 - 52 = 7.5 |
| 6 | $P_6$ | 37 - 52 = -15 | 41 - 52 = -11 |
| 7 | $P_7$ | 40.5 - 52 = 11.5 | 42.5 - 52 = -9.5 |
| 8 | $P_8$ | 13.5 - 52 = -36.5 | 19 - 52 = -33 |
| 9 | $P_9$ | 2 - 52 = -50 | 1 - 52 = -51 |
| 10 | $P_{10}$ | 124.5 - 52 = 72.5 | 119 - 52 = 67 |
| 11 | $P_{11}$ | 119 - 52 = 67 | 113 - 52 = 61 |
| 12 | $P_{12}$ | 138.5 - 52 = 86.5 | 131.5 - 52 = 79.5 |
| 13 | $P_{13}$ | 126.5 - 52 = 74.5 | 125 - 52 = 73 |
| 14 | $P_{14}$ | 135 - 52 = 83 | 139 - 52 = 81 |
| 15 | $P_{15}$ | 126 - 52 = 74 | 124 - 52 = 72 |
| 16 | $P_{16}$ | 138 - 52 = 84 | 135 - 52 = 83 |

## Precautions:

1. Leakage should be checked in the apparatus
2. Drain all the air out at manometer tubes before starting the experiment.

## Result:

At different loads are have studied journal bearing under axial and radial loading.