

JOURNAL BEARING

PRESSURE PROFILE OF JOURNAL BEARING

aim of Experiment:

- To demonstrate the pressure distribution in a loaded hydrodynamic journal bearing using the Journal Bearing Test Rig TR-60

Equipment: Journal Bearing Test Rig (Model TR-60)

Theory: Journal bearing is the simplest bearing consisting of Journal or shaft which is housed inside a bearing along with the lubricant. The shaft, when rotated, causes the lubricant around it to move. When a load is applied, the lubricant moves in a fashion so as to balance the load by generating hydrodynamic pressure profile. The contact between journal and the bearing is avoided because of the lubricant.

Experimental setup consists of a journal, which is driven by a DC motor, speed of journal can be controlled using the rpm knob. Also there is a pressure sensor attached to the bearing which is used to measure the pressure along the bearing. Stepper motor is used to drive the pressure sensor.

Procedure:

• *Handwritten notes*

Ball weight = 2.33 kg

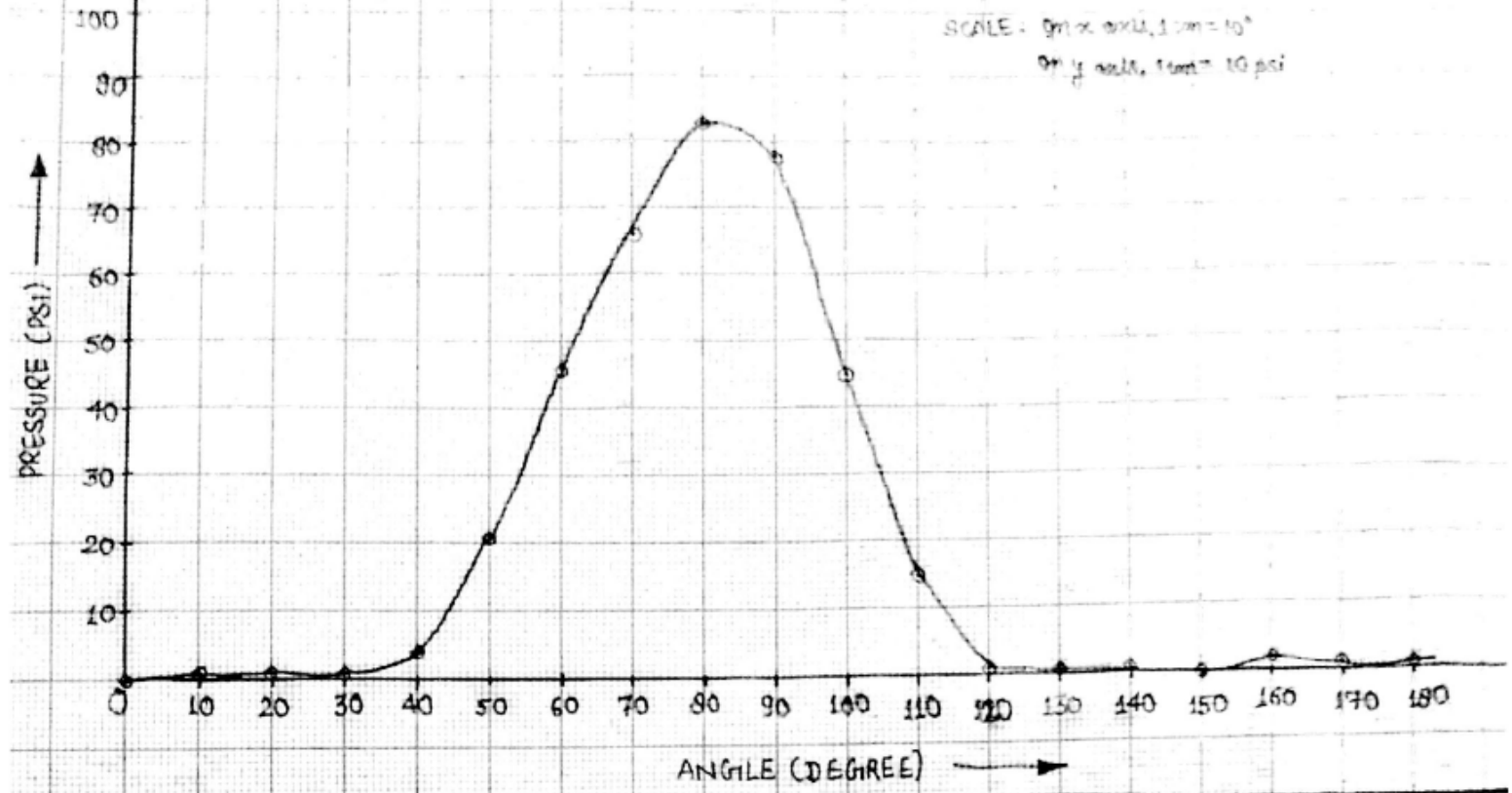
RPM = 1000

Lubricant = Castrol CRB+

Sl. No.	ANGLE (DEGREE)	PRESSURE (PSI)	
		LOAD = 100 N	LOAD = 200 N
1	0	0	0
2	10	1	1
3	20	1	2
4	30	1	0
5	40	4	2
6	50	21	0
7	60	46	8
8	70	66	10
9	80	83	15
10	90	78	16
11	100	45	3
12	110	15	1
13	112	1	1
14	130	1	0
15	140	1	1
16	150	0	0
17	160	2	0
18	170	1	1
19	180	1	0

- (i) Initially a load of 100 N was applied to the bearing
- (ii) RPM of the DC motor which drives the journal was set to 1000.
- (iii) Then, for each 10° rotation of pressure sensor, pressure was recorded.
- (iv) Readings for angles between 0° to 180° was taken.
- (v) Now, again the load was increased to 200 N and steps (ii), (iii) and (iv) were repeated.
- (vi) With the observed data, pressure profile for hydrodynamic journal bearing was plotted for the two different loading conditions.

PRESSURE VS ANGLE FOR LOAD = 100 N!



PRESSURE VS ANGLE FOR LOAD = 1200 NI

