Common Course Outline

IMTC 205
MECHANICAL DRIVES AND EQUIPMENT II

4 Semester Hours

The Community College of Baltimore County

Description

Mechanical Drives and Equipment II
Examines the operating characteristics of the various bearings used in industry; examines how metallurgic properties of various materials affect friction, finishes, tolerances, and the resultant requirements for the choice of bearings, lubricants and seals.
Prerequisite: IMTC 201 Mechanical Drives and Equipment I, or consent of instructor.

Overall Course Objectives.

Upon completion of this course the student will be able to:

A. define difference between plain and anti-friction bearings.
B. identify all types of anti-friction bearings (i.e. ball, roller, spherical roller, self-aligning type, angular contact type bearings, etc.)
C. cross-reference various manufacturers codes on bearings.
D. explain bearing installation and removal methods.
E. identify various types of seals employed with bearings.
F. identify which types of bearings and other applications.
G. identify the types of lubrication used for plain and anti-friction bearings.
H. demonstrate skill in making shims for setting proper bearing clearance.
I. define and recognize symptoms of bearing failure due to imbalance of vibration.
J. demonstrate skill in properly installing bearing with induction heating.
K. demonstrate skill in removing bearings with the use of a puller.
L. identify and apply seal installation methods which will be discussed in detail and put into application in lab.
M. define why speed reduction increases torque output on speed reducers.
N. demonstrate mastery of the skill involved in properly setting internal bearing clearance in speed reducers.
O. demonstrate skill in properly centering the worm and worm gear in a speed reducer for correct tooth contact.
P. define and recognize the various designs of pillow block type of anti-friction bearings.
Q. demonstrate skill in properly setting up pillow block type bearings (i.e. mounting and setting bearing for correct internal rolling clearance).
R. successfully perform the following laboratory requirements:
    1. properly rebuild a worm type speed reducer to required tolerances.
    2. properly set up and adjust a pillow block assembly to required specifications.
    3. properly set up (shim) and scrape in a set of babbitted bearings to required tolerances.
S. define correct method of making babbitted bearings.
T. identify when babbitt is at correct temperature for pouring.
U. define method of shimming for correct alignment of babbitted bearings.
V. demonstrate the art of scraping and fitting babbitted bearings.
W. demonstrate how to show babbitted bearings for correct running clearance.
X. use O.H.S.A.safety rules for all the above tasks.

Major Topics

I. Plain bearings
II. Anti-friction type bearings
III. Seals
IV. Pillow block type bearing
V. Work type speed reducers

Course Requirements

Exams 75%
Quizzes 25%
(Subject to revision by the instructor)

Other Course Information