

Name: _____ ID _____ Section _____

MCG 1100 - Dissection Lab 9 - Floppy Disc Drive
(to be completed and handed in at the end of the lab)

1. Identify the manufacturing processes used to make

- the plastic parts

injection moulding (only possible process for plastics)

- the sheet metal parts

stamping (i.e. press operations)

2. Using a micrometer, measure the thickness of the sheet metal top tray in mm and in inches.
Identify the material of which it is made.

Thickness 0.031 in, 0.79 mm

Material steel (probably "satin coat" galvanized)

3. Using a vernier caliper, measure the diameter of the lead screw that moves the read head in inches and in mm. (A micrometer would be more accurate, but it can't fit into the space near the shaft.)
Identify the material of which it is made.

Diameter 0.117 in, 3.0 mm

Material stainless steel

4. The read head has a thin sheet metal cap. What material is it made of?

aluminium (could also be stainless steel, but scratch test shows it is fairly soft)

5. Give a complete description of one of the screws that holds the sheet metal cover on OR of one of the screws that retains the guide rod that the read/write head slides on. (Hint: this will probably be a metric screw.)

M2 x 0.4 x 4 round head Philips (cover)

M2 x 0.4 x 2.5 OR M2.5 x 0.45 x 2.5 round head Philips (guide)

6. The lever assembly which opens the door on the floppy turns on a metal pin.

What metal it is made of? brass

Why was this material selected? very easy to machine with smooth finish, also good bearing material

In some of the drives, the four metal pins that the lower tray slides on are also made of this material, while in others they are cast integral with the housing. Briefly state advantages and disadvantages of these two designs in terms of manufacturing cost and durability.

cast integral: lower cost, easy to make, but less durable because zinc alloy of housing is soft

brass pins: costs more (separate parts must be made and assembled), but more durable

7. Examine the metal housing of the drive.

What material is it made of? zinc alloy

What processes were used to manufacture it? How were the threaded holes for screws produced?

die casting (smooth surfaces, many fine details and thin sections)

threaded holes: hole drilled, threads cut with a tap

8. What is the number of magnetic poles in the rotor of the drive motor? in the stator? Why are they different?

Most have 10 poles in the rotor (or 5 if you are counting north-south pairs).

There is a different number in the stator. This ensures that poles do not line up with poles on rotor; the poles that are out of line provide the torque needed to start the motor turning.

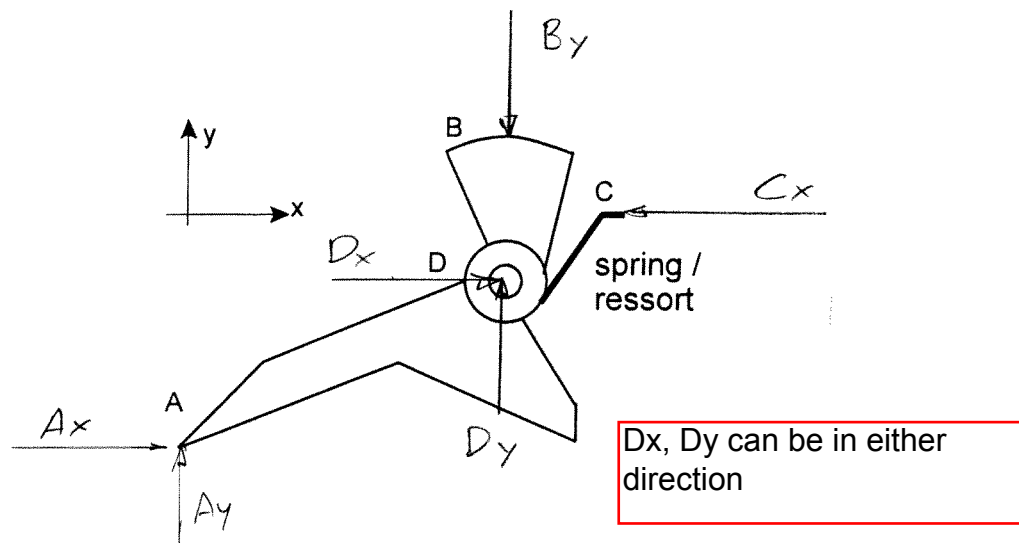
9. Of what material are the shaft and bearings
(a) that the read head slides on?

shaft steel or stainless steel; bearing is hard plastic or bronze (not all drives are the same)

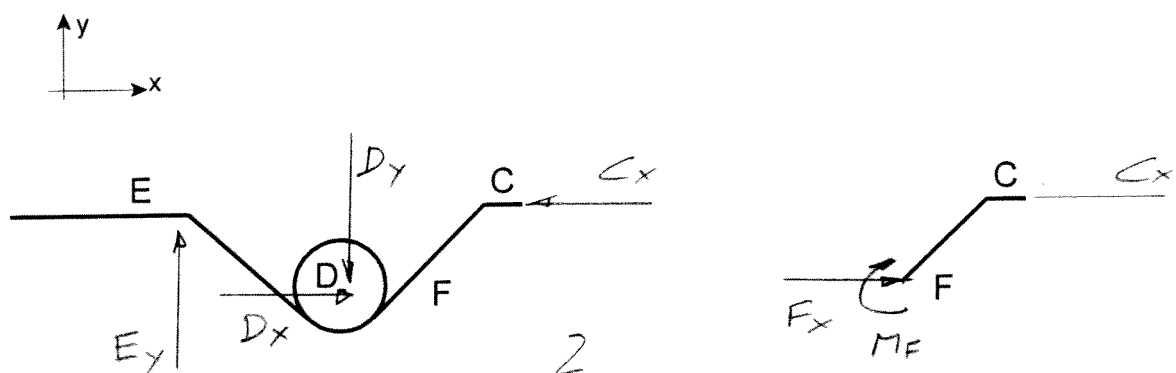
- (b) of the motor that drives the disc?

shaft steel or stainless steel; bearing is bronze (probably a porous bronze that retains oil)

10. Complete the following free-body diagram of the lever which opens the door of the disc case. Assume that contacts are frictionless, including the contact of spring C with the housing. Assume that this is in the position in which it is just starting to open the door.



11. Complete the following free-body diagram of the spring which is a part of the lever in question 10, and of the section CF of the spring. You can treat D as a frictionless pin, and E and C as frictionless contacts. For section FC, imagine cutting the spring at F, and decide what reactions are required at F for equilibrium.



Dx, Dy are not the same forces as in the previous FBD