

ME352A: Lab 2

Mechanisms 2A:

You need to form:

- Various inversions of a 3R-1P mechanism satisfying Grashof Criterion.
- one 3R-1P non-Grashof Mechanism

Report:

- Vary the link lengths and investigate the mobility of the smallest link in each case of the 3R-1P Grashof mechanism.
- Plot the distance traversed by the slider versus the rotation of the crank/rocker for both the Grashof and non-Grashof linkages(only the slider-crank mechanism for Grashof Linkage is considered here, rest all inversions are not considered)
- Discuss the features of the plots that you obtain.
- List and explain the difference that you see between Grashof and non-Grashof linkages.
- Verify that the two instances of Grashof linkages cannot be achieved by a single construction. Show that this is not the case for the non-Grashof linkage.

Pre Lab Work:

- Before coming to the lab make sure that you put down the kinematic diagrams of the mechanisms that you will construct.
- Formulate the Grashof criterion for these mechanisms.
- Put these on a paper with appropriate diagrams

Mechanisms 2B:

. Construct a Grashof and a non-Grashof 4R mechanism. Consider all possible cases of a Grashof linkage

Report:

- Plot the angular motion of the input link versus the rotation of the crank/rocker for both the Grashof and non-Grashof linkages
- Discuss the features of the plots that you obtain.
- List and explain the difference that you see between the various Grashof and non-Grashof linkages.
- Verify that two instances of Grashof linkages cannot be achieved by a single construction. Show that this is not the case for the non-Grashof linkage.

Pre Lab Task:

Understand the Grashof Criterion.

Mechanisms 2C:

Make a constrained 8-bar mechanism which consists of only binary and ternary links. You have been supplied with FOUR ternary links. Use them judiciously.

Report:

- Describe your number synthesis in detail.
- Show the 8-bar mechanism that you built.
- Report any 8-bar constrained mechanism that you missed.

Pre Lab Task:

- Do the number synthesis for a constrained 8-bar mechanism as taught in the class. Feel free to consult your textbook.
- Construct as many possible constrained 8-bar mechanisms as you can
- Put these on a paper with appropriate diagrams.

Mechanisms 2D (BONUS):

You need to form:

- Various inversions of R-P-R-P and 2R-2P mechanism satisfying Grashof Criterion.

Report:

- Vary the link lengths and investigate the mobility of the smallest link in each case of the R-P-R-P and 2R-2P mechanism.
- Verify that Grashof's criterion holds in each case.

Note: You are free to consult class notes and Textbook. Per group two protractors and two scales will be needed. Pre Lab Work will aid you during your Lab Hours so do them and get them signed by TA at the beginning of the lab. The BONUS part is supposed to be done after you complete the first three parts.

Enjoy the Lab!!!