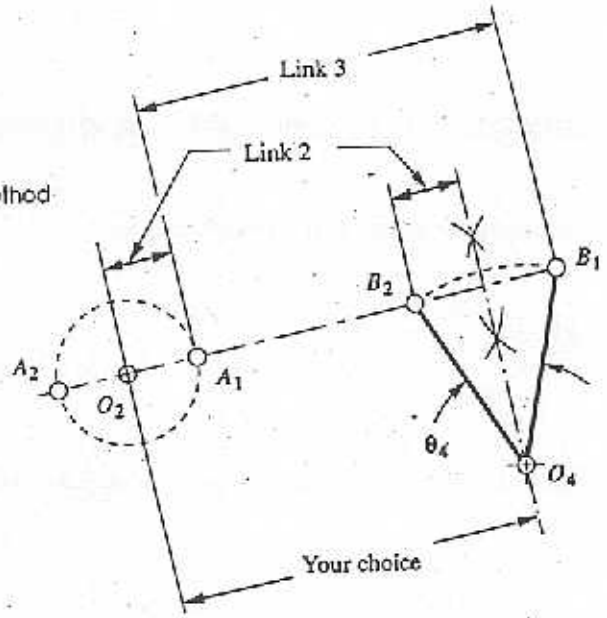
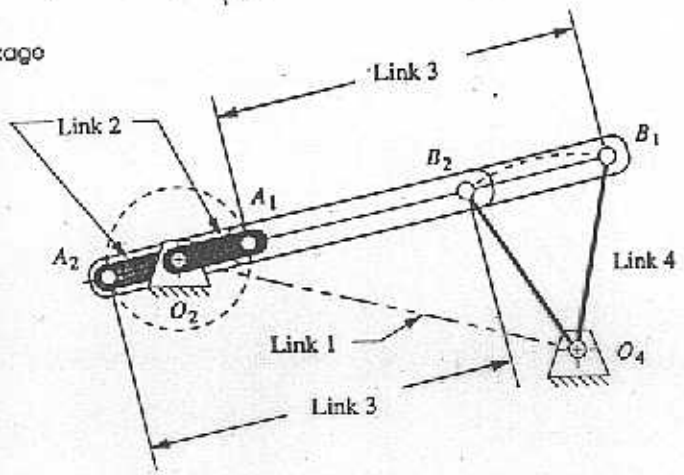
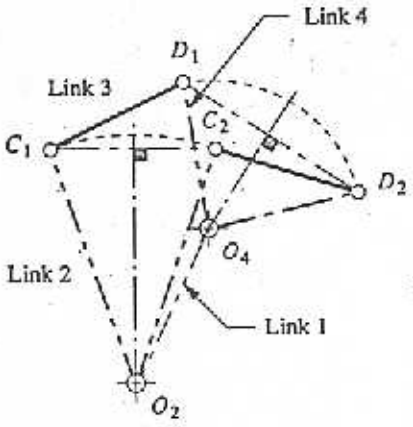
(a) Construction method

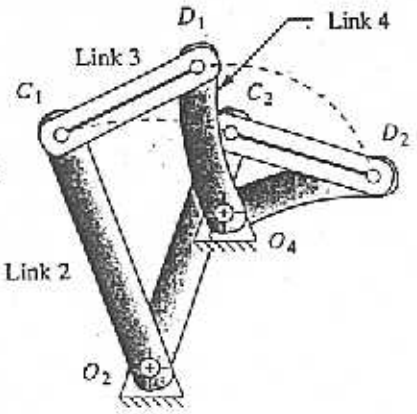


(b) Finished linkage

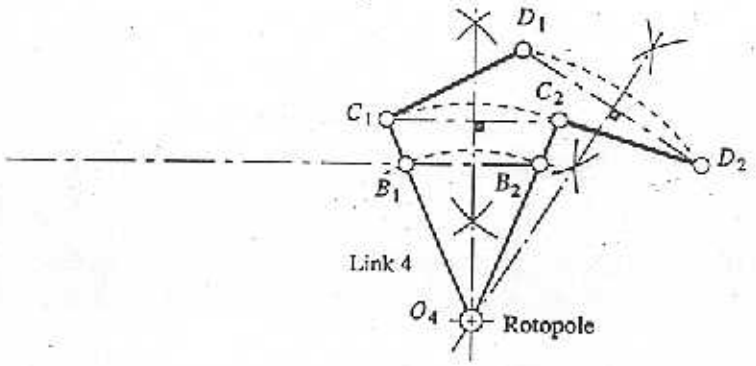




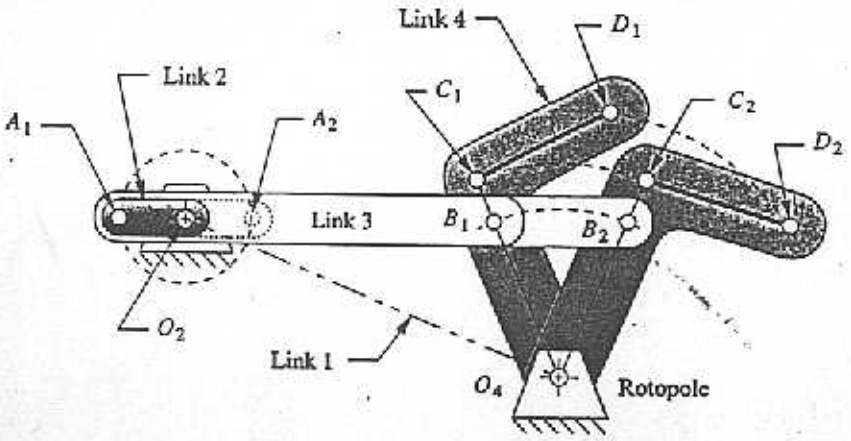
(a) Two-position synthesis



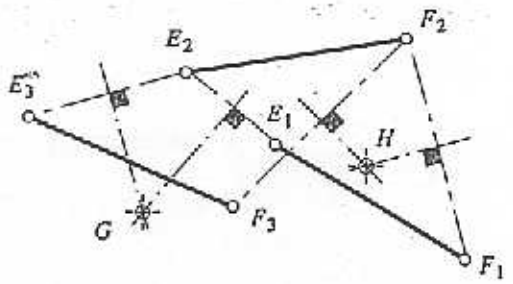
(b) Finished non-Grashof fourbar



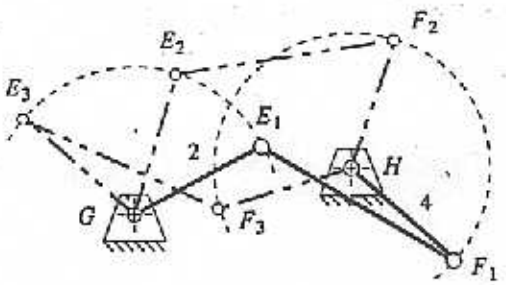
(c) Finding the rotopole for Example 3-2



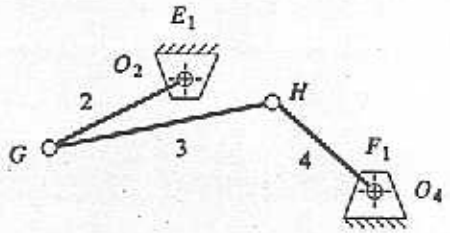
(b) Constructing the linkage by the method in Example 3-1



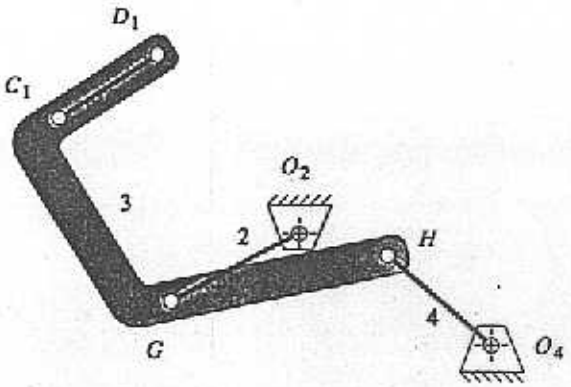
(a) Construction to find rotopoles G and H



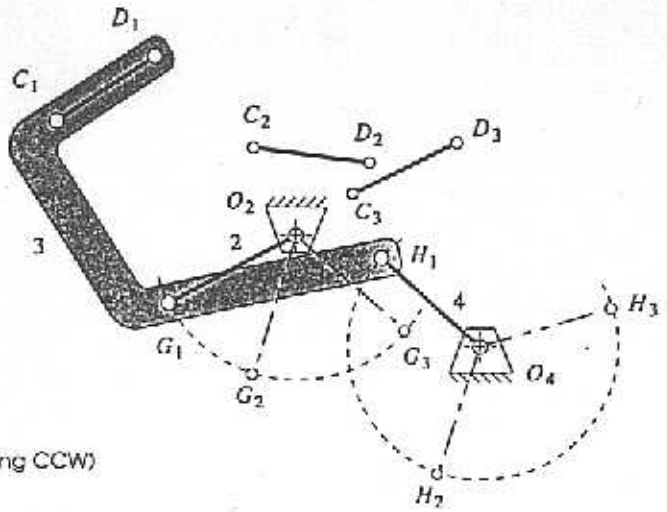
(b) The correct inversion of desired linkage



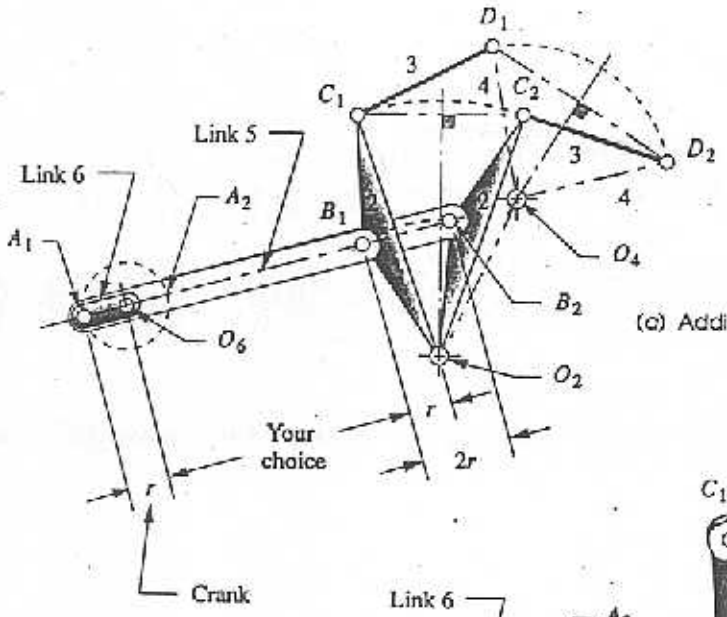
(c) Reinvert to obtain the result



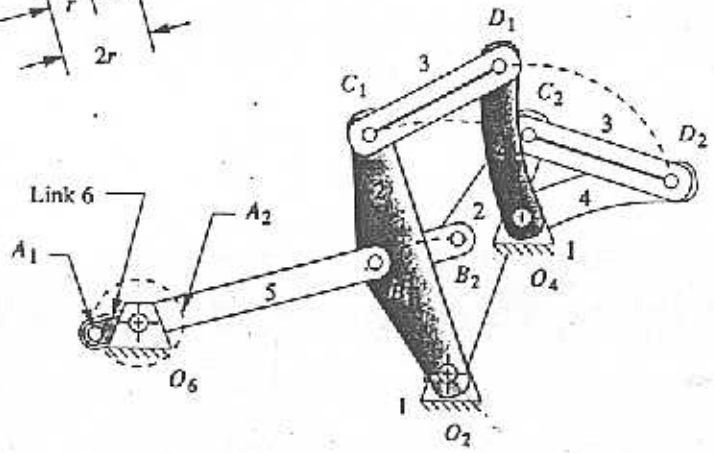
(d) Re-place line CD on link 3



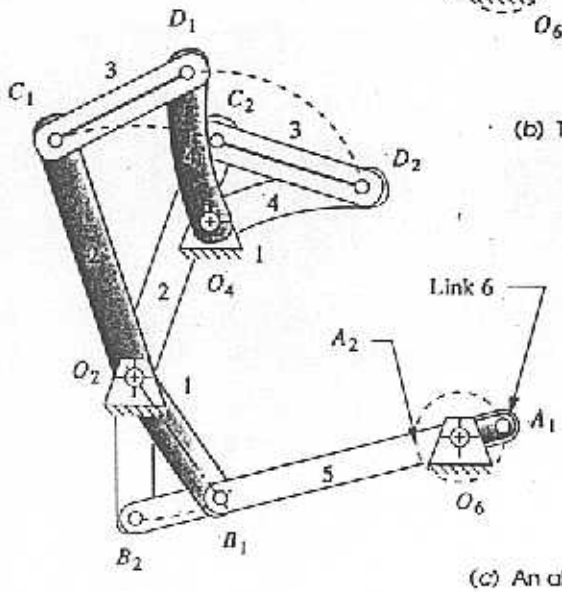
(e) The three positions (link 4 driving CCW)



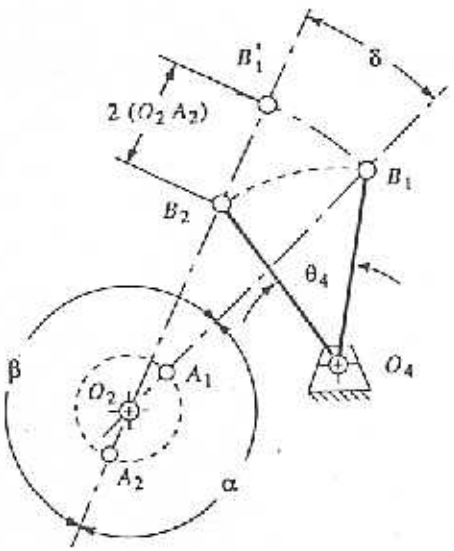
(a) Adding a driver dyad to the fourbar chain



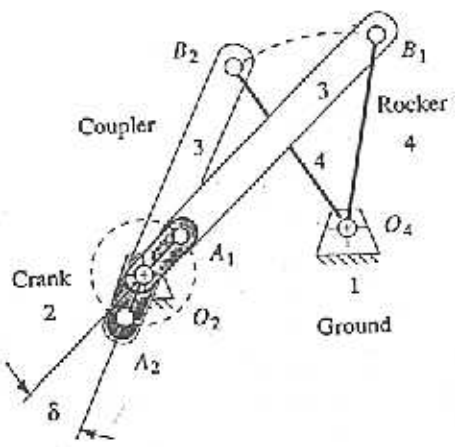
(b) The completed Watt's sixbar linkage with motor at O_6



(c) An alternate location of the driver dyad with motor at O_6

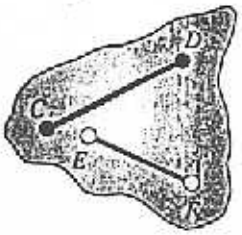


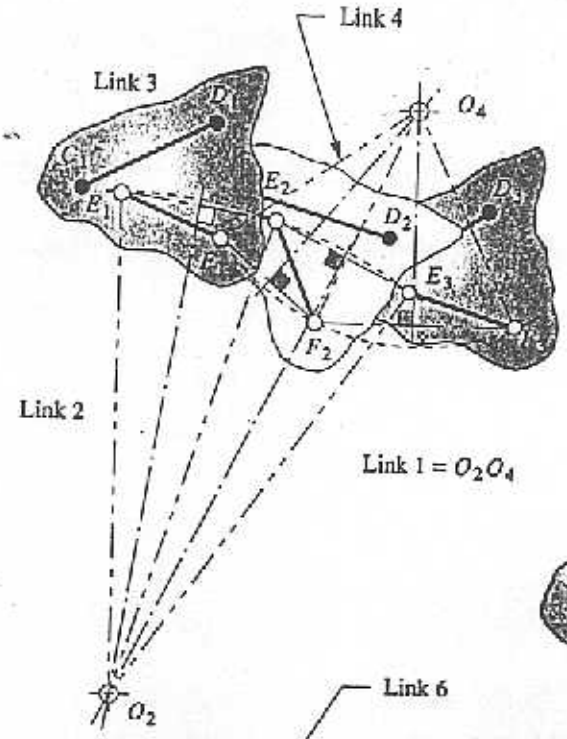
(a) Construction of a quick-return Grashof crank-rocker



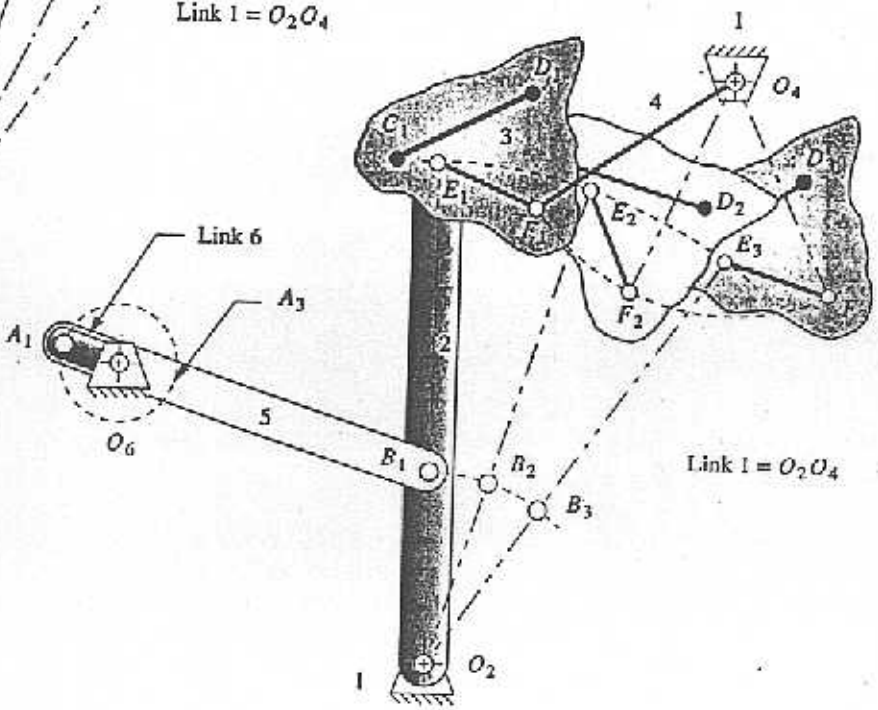
(b) The finished linkage in its two toggle positions

(a) Alternate attachment points

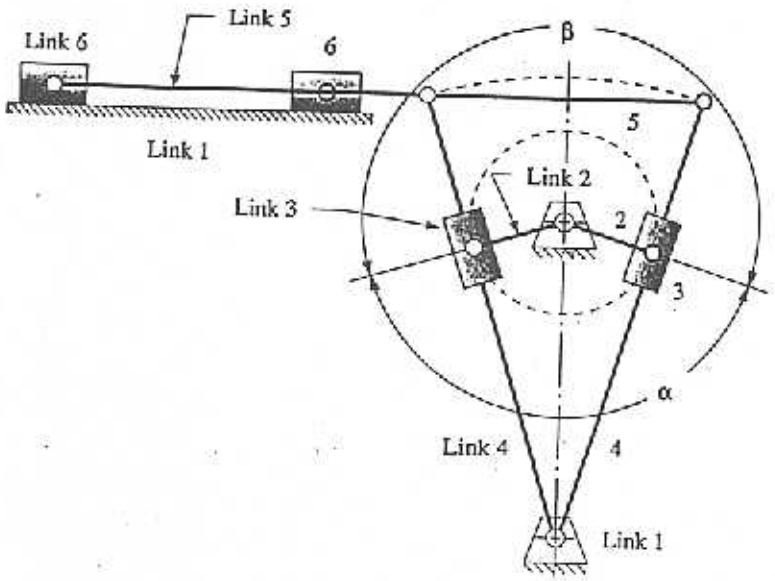


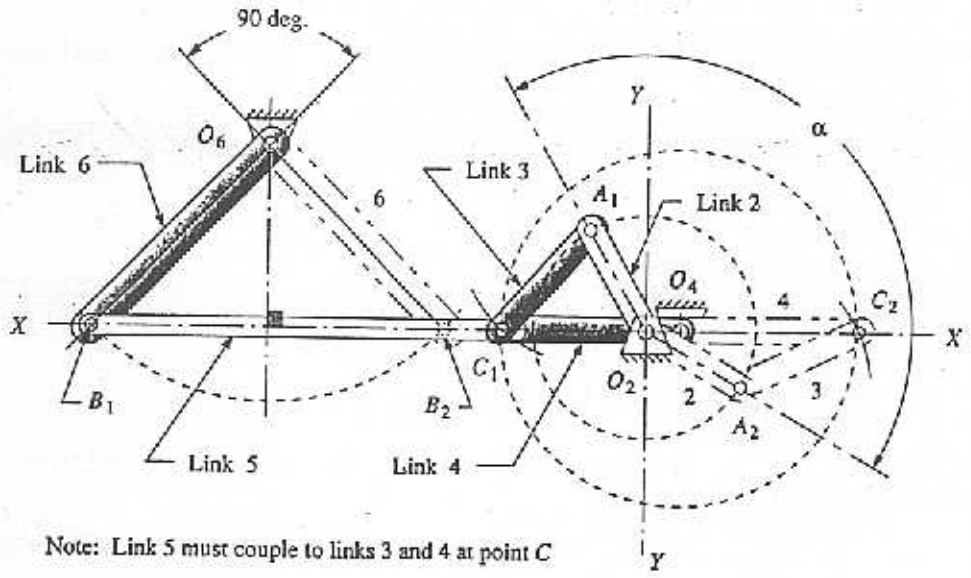


(b) Three-position synthesis



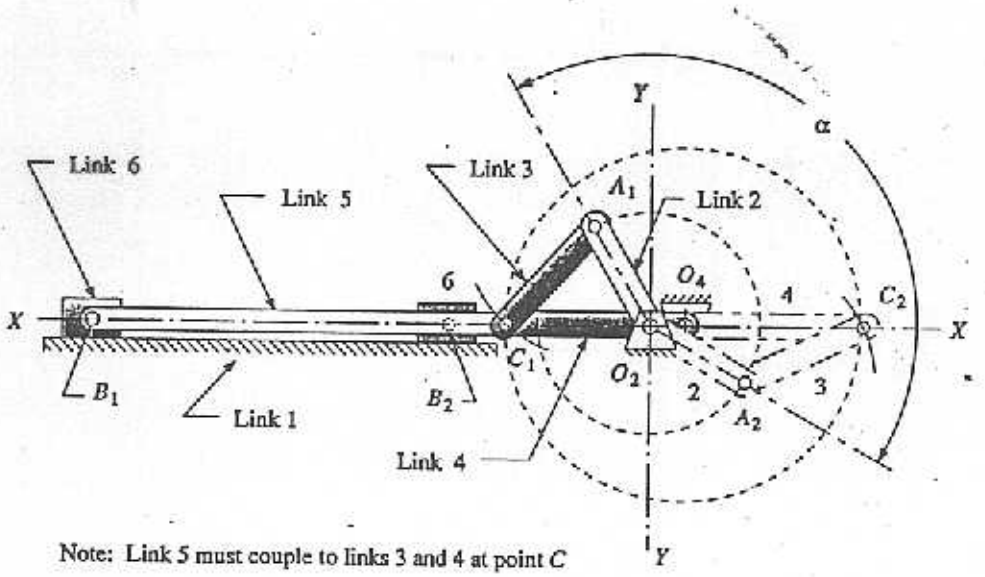
(c) Completed Watt's sixbar linkage with motor at O_6





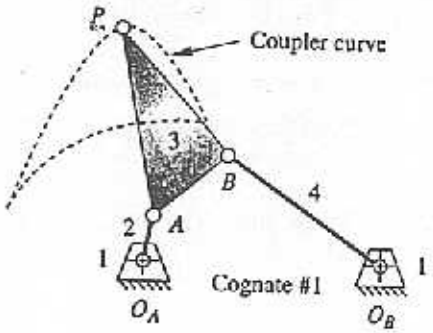
Note: Link 5 must couple to links 3 and 4 at point *C*

(a) Rocker output sixbar drag link quick-return mechanism

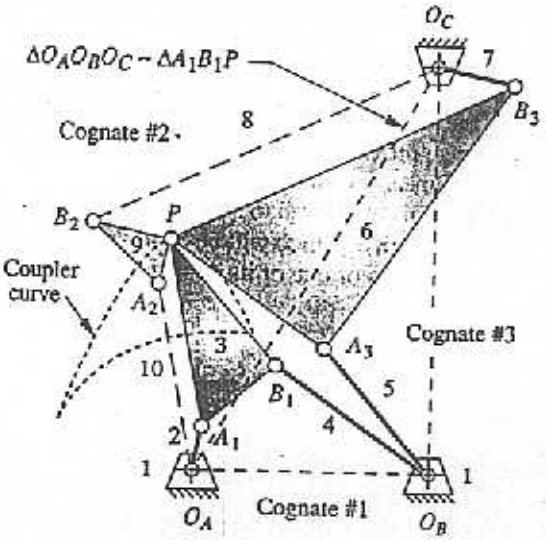


Note: Link 5 must couple to links 3 and 4 at point *C*

(b) Slider output sixbar drag link quick-return mechanism

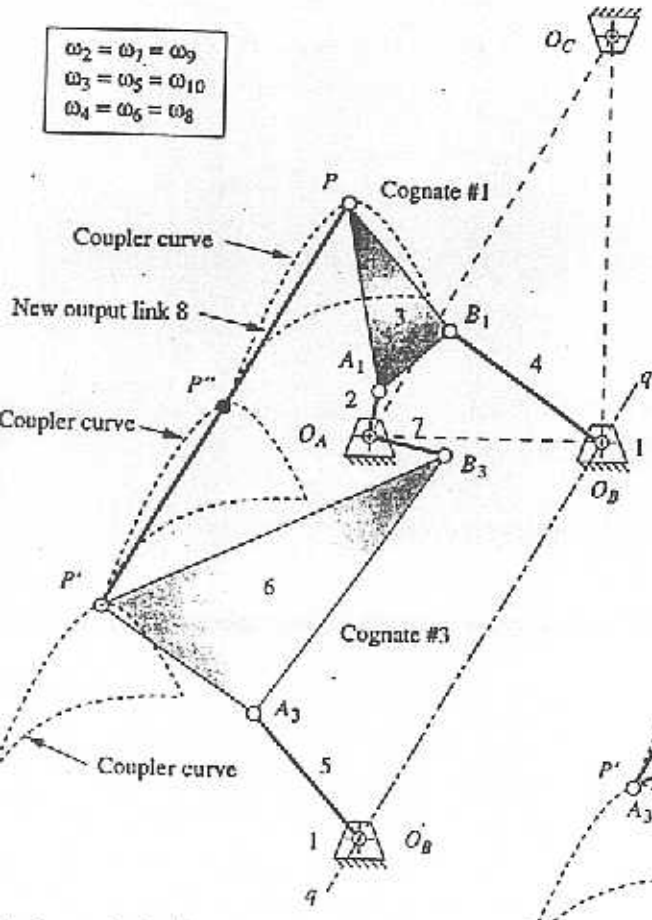


(a) Original fourbar linkage with coupler curve

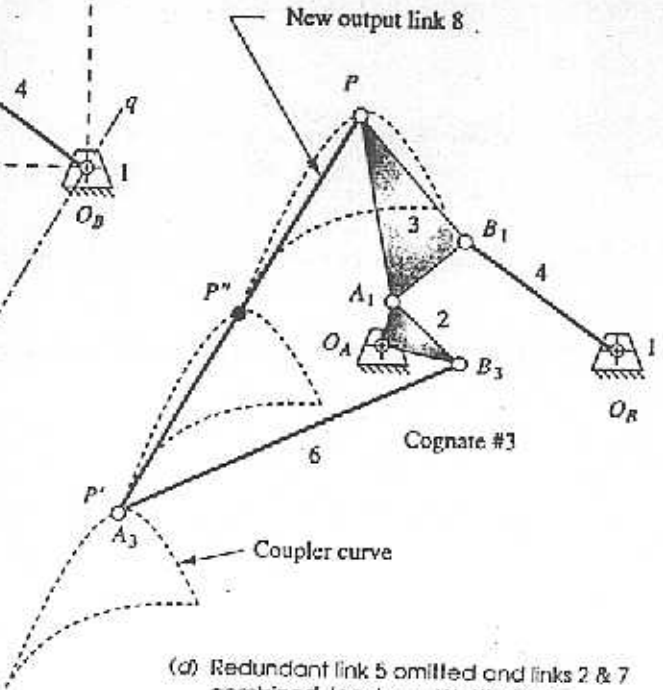


(b) Roberts diagram showing all cognates

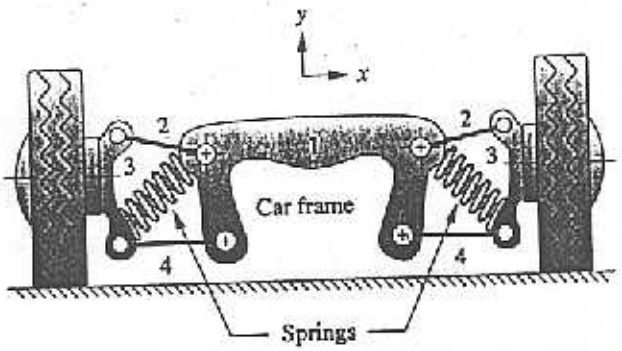
$\omega_2 = \omega_7 = \omega_9$
$\omega_3 = \omega_5 = \omega_{10}$
$\omega_4 = \omega_6 = \omega_8$



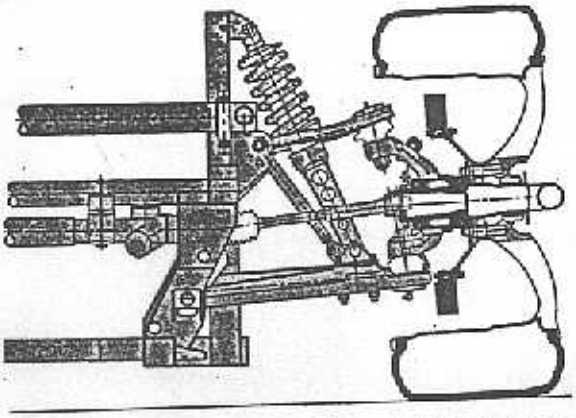
(c) Cognate #3 shifted with O_C moving to O_A



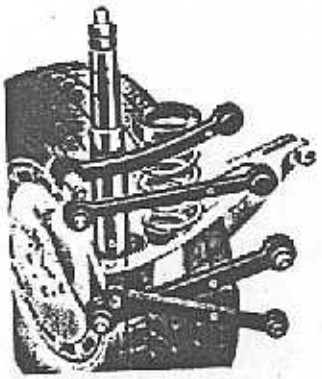
(d) Redundant link 5 omitted and links 2 & 7 combined leaving a Watt's sixbar



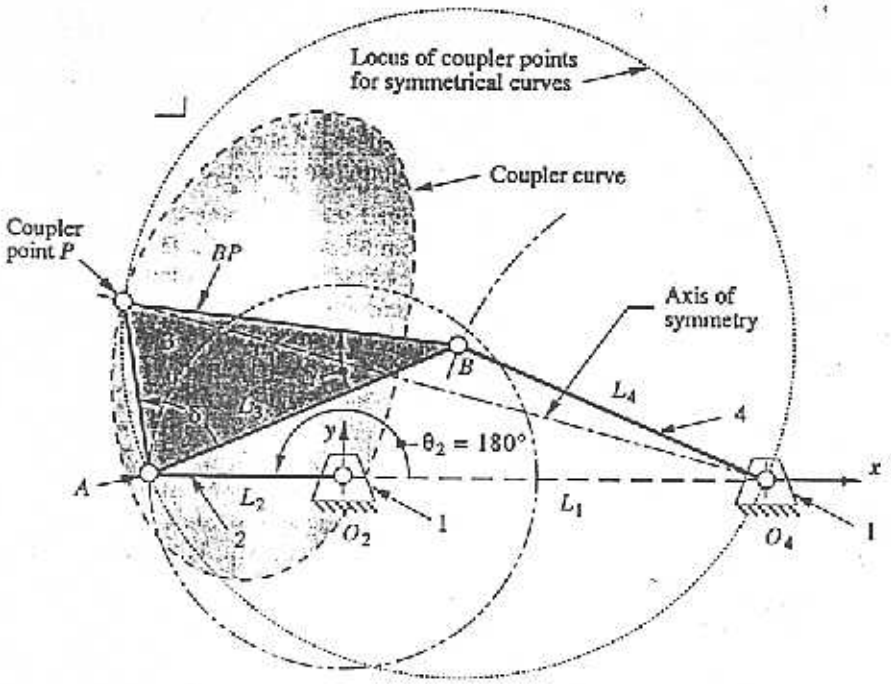
(a) Fourbar planar linkages are duplicated in parallel planes, displaced in the z direction, behind the links shown

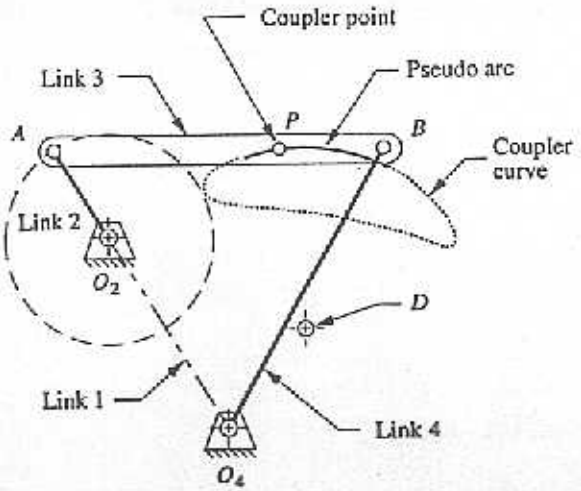


(b) Parallel-planar linkage used to control Viper wheel motion
(Courtesy of Chrysler Corporation)

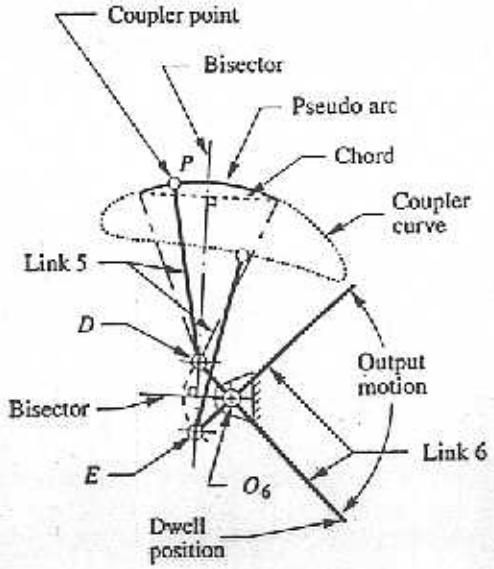


(c) Multi-link true spatial linkage used to control rear wheel motion
(Courtesy of Mercedes-Benz of North America Inc.)

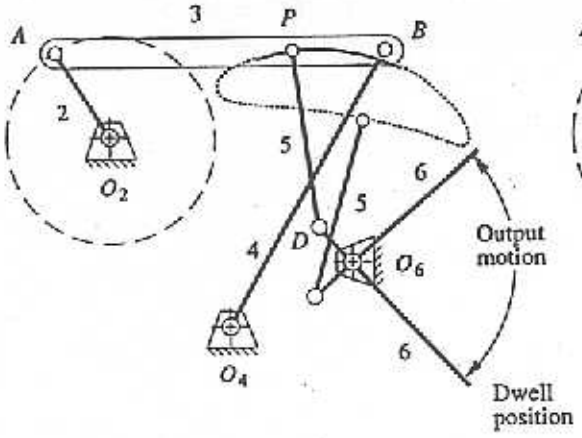




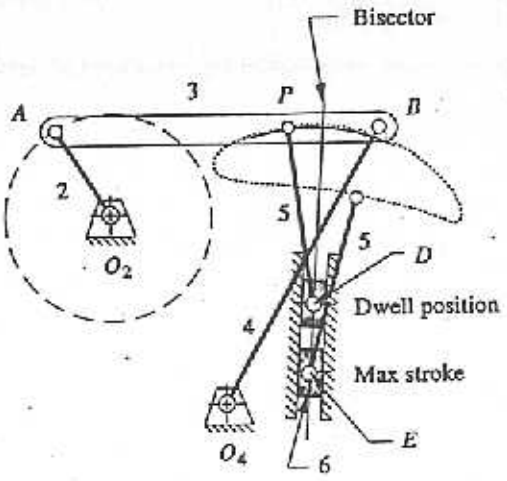
(a) Chosen fourbar crank-rocker with pseudo-arc section for 60° of link 2 rotation



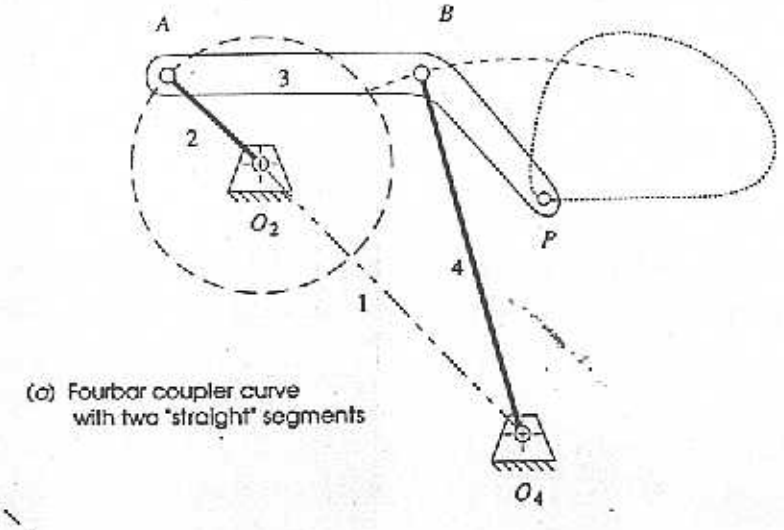
(b) Construction of the output-dwell dyad



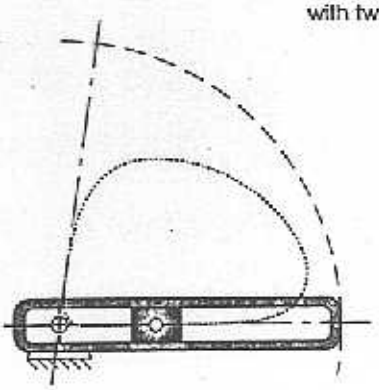
(c) Completed sixbar single-dwell linkage with rocker output option



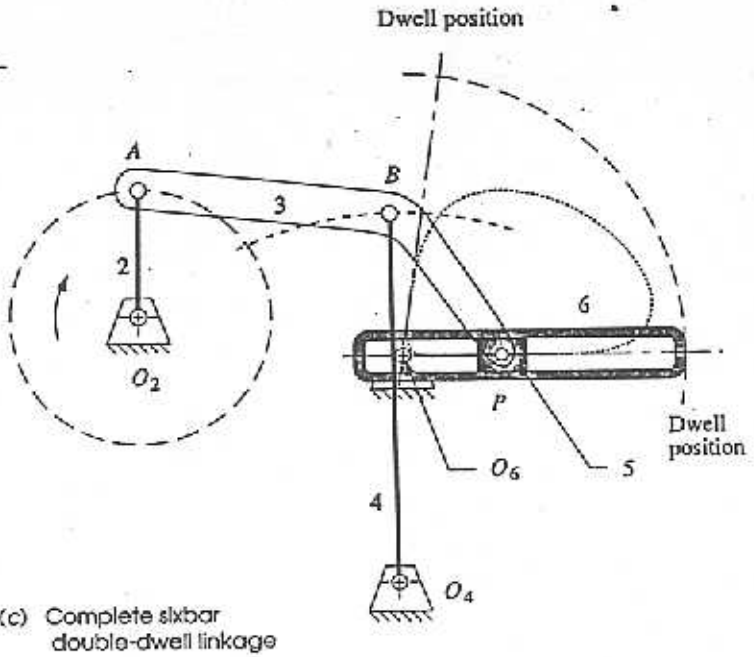
(d) Completed sixbar single-dwell linkage with slider output option



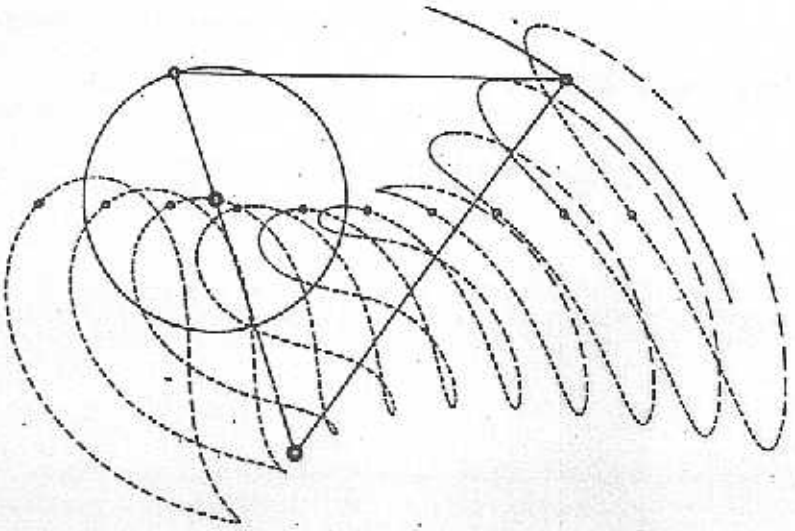
(a) Fourbar coupler curve with two "straight" segments



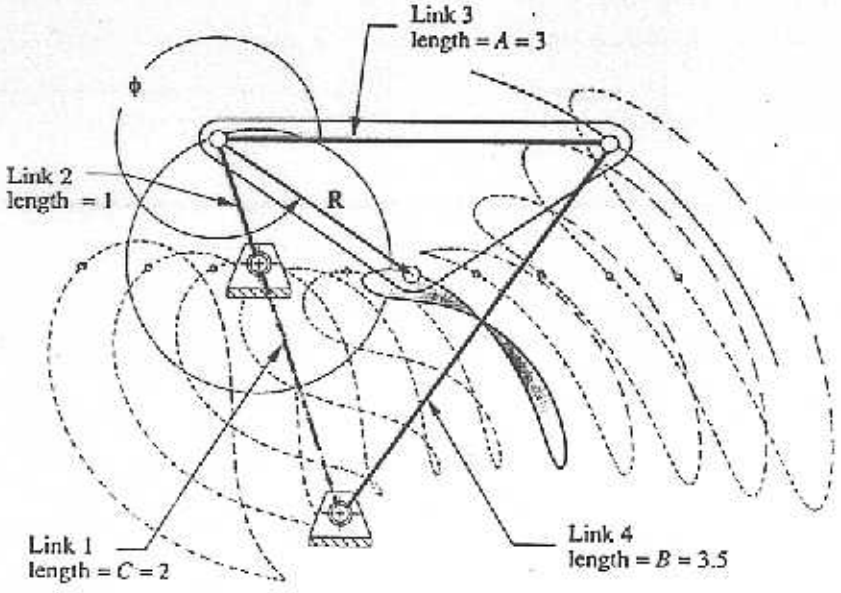
(b) Slider dyad for double-dwell



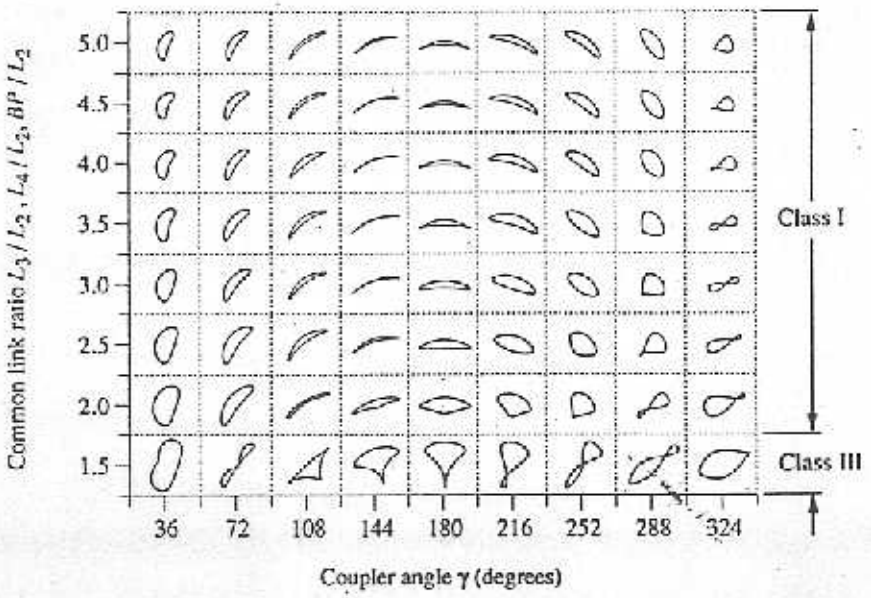
(c) Complete sixbar double-dwell linkage



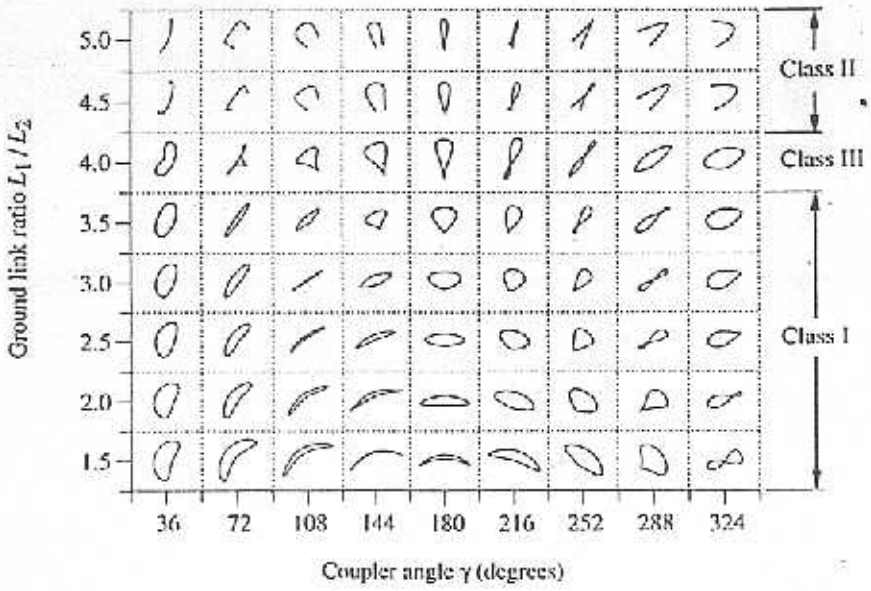
(a) A page from the Hrones and Nelson atlas of fourbar coupler curves
Hrones, J. A., and G. L. Nelson (1951). Analysis of the Fourbar Linkage. MIT Technology Press, Cambridge, MA. Reprinted with permission.



(b) Creating the linkage from the information in the atlas



(a) Variation of coupler curve shape with common link ratio and coupler angle for a ground link ratio $L_1 / L_2 = 2.0$



(b) Variation of coupler curve shape with ground link ratio and coupler angle for a common link ratio $L_3 / L_2 = L_4 / L_2 = BP / L_2 = 2.5$