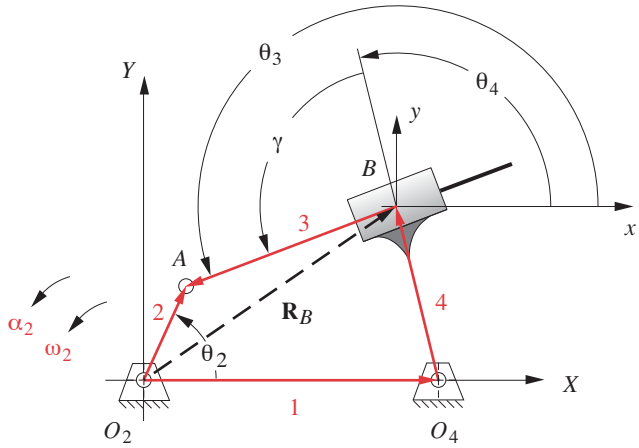


**FIGURE P7-3**

Configuration and terminology for problems 7-7 to 7-8 and 7-59

*†7-7 The link lengths and the values of $\theta_2$, $\omega_2$, and $\gamma$ for some inverted fourbar slider-crank linkages are defined in Table P7-3. The general linkage configuration and terminology are shown in Figure P7-3. *For the row(s) assigned*, find the accelerations of the pin joints *A* and the acceleration of slip at the sliding joint. Solve by the analytical vector loop method of Section 7.3 for the open configuration of the linkage.

*†7-8 Repeat problem 7-7 for the crossed configuration of the linkage.

†7-59 Write a program using an equation solver or any computer language to solve for the displacements, velocities, and accelerations in an inverted slider-crank linkage as shown in Figure P7-3. Plot the variation in all link's angular and all pin's linear positions, velocities, and accelerations with a constant angular velocity input to the crank over one revolution for both open and crossed configurations of the linkage. To test the program, use data from row *e* of Table P7-3 except for the value of $\alpha_2$ which will be set to zero for this exercise.

* Answers in Appendix F.

† These problems are suited to solution using *Mathcad, Matlab,* or *TKSolver* equation solver programs.

**TABLE P7-3 Data for Problems 7-7 to 7-8**

| Row | Link 1 | Link 2 | Link 4 | $\gamma$ | $\theta_2$ | $\omega_2$ | $\alpha_2$ |
|---|---|---|---|---|---|---|---|
| *a* | 6 | 2 | 4 | 90 | 30 | 10 | – 25 |
| *b* | 7 | 9 | 3 | 75 | 85 | –15 | – 40 |
| *c* | 3 | 10 | 6 | 45 | 45 | 24 | 30 |
| *d* | 8 | 5 | 3 | 60 | 25 | – 50 | 20 |
| *e* | 8 | 4 | 2 | 30 | 75 | – 45 | – 5 |
| *f* | 5 | 8 | 8 | 90 | 150 | 100 | – 65 |