

**FIGURE P9-3**

Automotive differential planetary gear train for Problem 9-27

\*†9-27 Figure P9-3 shows a planetary gear train used in an automotive rear-end differential (not to scale). The car has wheels with a 16-in rolling radius and is moving forward in a straight line at 55 mph. The engine is turning 2500 rpm. The transmission is in direct drive (1:1) with the driveshaft.

- What are the rear wheels' rpm and the gear ratio between ring and pinion?
- As the car hits a patch of ice, the right wheel speeds up to 800 rpm. What is the speed of the left wheel? Hint: The average of both wheels' rpm is a constant.
- Calculate the fundamental train value of the epicyclic stage.

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\* Answers in Appendix F.

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