

Automotive Technology 6th Edition

Chapter 120 – Steering Columns and Gears

Lesson Plan



CHAPTER SUMMARY:

1. Steering wheels, steering wheel removal, steering columns, and conventional steering gears
 2. Recirculating ball steering gear and steering gear adjustment
 3. Rack-and-pinion steering gear and rack-and pinion adjustments
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OBJECTIVES:

1. Describe the purpose and function of a steering wheel.
 2. Explain how to remove a steering wheel.
 3. Discuss steering columns and intermediate shafts.
 4. Explain the purpose and function of conventional steering gears.
 5. Explain how a recirculating ball steering gear works.
 6. Describe how a rack-and-pinion steering gear works.
 7. This chapter will help prepare for Suspension and Steering (A4) ASE certification test content area “A” (Steering System Diagnosis and Repair).
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RESOURCES: (All resources may be found at <http://www.jameshalderman.com>)

1. **Task Sheet ASE (A4-B-1) P-1, (A4-B-2) P-1:** Airbag System and Steering Wheel Service
 2. **Task Sheet ASE (A4-B-3) P-2, (A4-B-6) P-2:** Steering Column Related Diagnosis
 3. **Task Sheet ASE (A4-B-7) P-2:** Steering Gear Adjustment and Replacement
 4. Chapter PowerPoint
 5. Chapter Crossword Puzzle and Word Search
 6. Animations: Rack and Pinion Steering
 7. Videos: See list at the end of the lesson plan.
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ACTIVITIES:

1. **Task Sheet ASE (A4-B-1) P-1, (A4-B-2) P-1:** Have students complete Airbag System and Steering Wheel Service Task Sheet.
 2. **Task Sheet ASE (A4-B-3) P-2, (A4-B-6) P-2:** Have students complete Steering Column Related Diagnosis Task Sheet.
 3. **Task Sheet ASE (A4-B-7) P-2:** Have students complete Steering Gear Adjustment and Replacement Task Sheet.
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ASSIGNMENTS:

1. Chapter crossword and word search puzzles.
 2. Complete end of chapter 10 question quiz.
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CLASS DISCUSSION:

1. Review and group discussion chapter Frequently Asked Questions and Tech Tips sections.
 2. Review and group discussion of the five (5) chapter Review Questions.
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NOTES AND EVALUATION:



Videos: (at <http://www.jameshalderman.com>)

Diagnosing Steering Shudder and Noise (time 14:54)

Clunk noise when turning (time 1:01)

Steering rack removal (time 6:42)

Steering inspection (time 6:47)

Rack and pinion replacement (time 6:45)

Rack and pinion steering (time 2:36)

Steering wheel removal (time 7:23)

Steering wheel removal (time 6:51)

Dis-arming and air bag system (time 3:31)

How a clockspring works (time 1:40)

How an airbag system works (time 4:41)

How an airbag system works (time 1:20)

Airbag (time 0:30)

Installing a clockspring (time 2:54)

Testing a clockspring (time 2:16)

Replace a rack and pinion (time 25:33)

Steering column lock (time 4:19)

Rack and pinion (time 0:31)

Air bag removal (time 7:43)

Clockspring (time 8:34)

Steering binding (time 2:46)

Lock cylinder replacement (time 2:28)

Loose outer tie rod end (time 0:17)

Loose inner tie rod end (time 0:47)

FWD steering and suspension (time 0:32)

Pitman shaft seal (time 7:41)

Intermediate shaft issues (time 2:02)