

# Automotive Technology 7<sup>th</sup> Edition

## Chapter 125 – Drive Axles and Differentials

### Lesson Plan



#### **CHAPTER SUMMARY:**

1. Drive Axles, Parts of a Drive Axle, Drive Axle Gear Ratios, Open Differentials, and Limited Slip Differentials
2. Drive Axle Components, Axle Bearings, Drive Axle Identification, and Determining the Axle Ratio
3. Rear-End Noise Diagnosis, Drive Axle Inspection, and Drive Axle Disassembly
4. Pinion Shaft Bearing Replacement, Drive Pinion Depth, and Pinion Gear Preload
5. Checking and Correcting Backlash, Setting Side Bearing Preload, and Reassembly of the Drive Axle
6. Drive Axle Lubricant



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#### **OBJECTIVES:**

1. Describe the purpose and function of a drive axle.
  2. Describe the parts of a drive axle.
  3. Describe drive axle gear ratios.
  4. Discuss open differentials.
  5. Discuss limited slip differentials.
  6. Describe the components of a drive axle.
  7. Describe rear axle bearings.
  8. Explain how to identify drive axles.
  9. Explain how to determine the axle ratio.
  10. Discuss rear-end noise diagnosis.
  11. Discuss drive axle inspection.
  12. Discuss drive axle disassembly.
  13. Explain how to replace the pinion shaft bearing.
  14. Explain how to set the drive pinion depth.
  15. Discuss how to set the preload for pinion gears.
  16. Describe the procedure to check and correct backlash.
  17. Discuss how to set the preload for side bearings.
  18. Discuss drive axle reassembly.
  19. Discuss drive axle lubricants.
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**RESOURCES:** (All resources may be found at jameshalderman.com)

1. Task Sheet: Differential Noise Diagnosis
2. Task Sheet: Drive Axle Fluid Leaks
3. Task Sheet: Pinion Seal Replacement
4. Task Sheet: Ring Gear Runout
5. Task Sheet: Differential Assembly Inspection
6. Task Sheet: Drive Pinion Depth
7. Task Sheet: Drive Pinion Bearing Preload
8. Task Sheet: Differential Side Bearing Preload
9. Task Sheet: Ring and Pinion Tooth Pattern
10. Task Sheet: Differential Pinion Gears and Case
11. Task Sheet: Differential Case Assembly
12. Task Sheet: Limited Slip Differential Diagnosis
13. Task Sheet: Check, Drain and Refill Differential Case
14. Task Sheet: Limited Slip Differential Rotating Torque
15. Crossword Puzzle and Word Search
16. Chapter PowerPoint
17. Videos: [\(A3\) Manual Drive Train Axles Videos](#)
18. Animations: [\(A3\) Manual Drive Train Axles Animations](#)



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#### **ACTIVITIES:**

1. Task Sheet: Differential Noise Diagnosis
2. Task Sheet: Drive Axle Fluid Leaks
3. Task Sheet: Pinion Seal Replacement
4. Task Sheet: Ring Gear Runout
5. Task Sheet: Differential Assembly Inspection
6. Task Sheet: Drive Pinion Depth
7. Task Sheet: Drive Pinion Bearing Preload
8. Task Sheet: Differential Side Bearing Preload
9. Task Sheet: Ring and Pinion Tooth Pattern
10. Task Sheet: Differential Pinion Gears and Case
11. Task Sheet: Differential Case Assembly
12. Task Sheet: Limited Slip Differential Diagnosis
13. Task Sheet: Check, Drain and Refill Differential Case
14. Task Sheet: Limited Slip Differential Rotating Torque
15. Crossword Puzzle and Word Search



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#### **ASSIGNMENTS:**

1. Chapter crossword and word search puzzles from the website.
  2. Complete end of chapter quiz from the textbook.
  3. Complete multiple choice and short answer quizzes downloaded from the website.
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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:**

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