Manual Drivetrains and Axles 9th Edition Chapter 13 – Drive Axle and Differential Diagnosis and Service

CHAPTER SUMMARY:

- 1. Drive Axle Service, Drive Axle Lubrication, Drive Axle Diagnosis, and In-The-Shop Inspections
- 2. On-Vehicle Service Operations, Pinion Shaft Seal Replacement, and Differential Carrier Service
- 3. Differential Assembly Service, Drive Pinion Shaft, and Carrier Assembly and Setup
- 4. Limited Slip Differential Service



OBJECTIVES:

- 1. Perform the maintenance needed to keep a drive axle operating properly.
- 2. Describe the steps involved in drive axle service.
- 3. Discuss drive axle lubrication.
- 4. Discuss drive axle diagnosis.
- 5. Discuss the procedures for in-the-shop inspections.
- 6. Explain the on-vehicle service operations.
- 7 Explain the procedure for differential carrier service and differential assembly service.
- 8 Explain pinion depth shim selection and drive pinion bearing preload adjustment.
- 9 Explain the steps to adjust backlash and carrier bearing preload.

RESOURCES: (All resources may be found at http://www.jameshalderman.com)

- 1. Task Sheet: Drive Axle Shaft Service
- 2. Task Sheet: Drive Axle Flange Runout and Axle End Play
- 3. Task Sheet: Drive Axle Shaft Wheel Studs
- 4. Task Sheet: Drive Axle Seals, Bearings and Retainers
- 5. Task Sheet: Differential Noise Diagnosis
- 6. Task Sheet: Differential Fluid Leaks
- 7. Task Sheet: Pinion Seal Replacement
- 8. Task Sheet: Ring Gear Runout
- 9. Task Sheet: Differential Assembly Inspection
- 10. Task Sheet: Drive Pinion Depth
- 11. Task Sheet: Drive Pinion Bearing Preload
- 12. Task Sheet: Differential Side Bearing Preload
- 13. Task Sheet: Ring and Pinion Tooth Pattern
- 14. Task Sheet: Differential Pinion Gears and Case
- 15. Task Sheet: Differential Case Assembly
- 16. Task Sheet: Limited Slip Differential Diagnosis
- 17. Task Sheet: Check, Drain and Refill Differential Case
- 18. Task Sheet: Limited Slip Differential Rotating Torque
- 19. Chapter PowerPoint
- 20. Crossword Puzzle and Word Search
- 21. Videos: (A3) Manual Drive Train Axles Videos
- 22. Animations: (A3) Manual Drive Train Axles Animations





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ACTIVITIES:

DEMO

- 1. Task Sheet: Drive Axle Shaft Service
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- 5. Task Sheet: Differential Noise Diagnosis
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- 15. Task Sheet: Differential Case Assembly
- 16. Task Sheet: Limited Slip Differential Diagnosis
- 17. Task Sheet: Check, Drain and Refill Differential Case
- 18. Task Sheet: Limited Slip Differential Rotating Torque
- 19. Crossword Puzzle and Word Search

ASSIGNMENTS:

- 1. Chapter crossword and word search puzzles.
- 2. Complete end of chapter 10 question quiz.
- 3. Complete multiple choice and short answer quizzes downloaded from the website.

CLASS DISCUSSION:

- 1. Review and group discussion chapter <u>Frequently Asked Questions</u> and <u>Tech Tips</u> sections.
- 2. Review and group discussion of the five (5) chapter Review Questions.



NOTES AND EVALUATION:

