

Automotive Technology 6th Edition

Chapter 131 – Four-Wheel Drive and All-Wheel Drive

Lesson Plan



CHAPTER SUMMARY:

1. Four-wheel-drive systems, all-wheel drive, and front and rear differential ratios
 2. Transfer case, interaxle differential, and four-wheel-drive axles
 3. Transfer case service and problem diagnosis and diagnosis and servicing locking hubs
 4. Transfer case service
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OBJECTIVES:

1. Explain the operation of four-wheel-drive and all-wheel-drive systems.
 2. Describe the components of a transfer case.
 3. Discuss the purpose and function of an interaxle differential.
 4. Describe the different types of four-wheel-drive axles.
 5. Describe the procedure to diagnose and service transfer cases and locking hubs
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RESOURCES: (All resources may be found at <http://www.jameshalderman.com>)

1. **Task Sheet ASE (A3-F-1) P-3:** Inspect and Adjust Shifting Controls
 2. **Task Sheet ASE (A3-F-2) P-3:** Inspect Front Locking Hubs
 3. **Task Sheet ASE (A3-A-2) P-1, (A3-F-3) P-3:** Transfer Case Lube Level Check
 4. **Task Sheet ASE (A3-F-4) P-2, (A3-F-5) P-3:** Four-Wheel Drive Diagnosis
 5. **Task Sheet ASE (A3-F-7) P-2:** Transfer Case Replacement
 6. **Task Sheet ASE (A3-F-6) P-3:** Transfer Case Electrical Components
 7. **Task Sheet ASE (A3-F-7) P-2:** Transfer Case Disassembly and Reassembly
 8. Chapter PowerPoint
 9. Chapter Crossword Puzzle and Word Search
 10. Animations: Active 4WD, Active 4WD Transfer Case, and AWD Differentials
 11. Animations: Measure Tire Circumference and Transfer Case, Chain Drive
 12. Videos: See list at the end of the lesson plan.
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ACTIVITIES:

1. **Task Sheet ASE (A3-F-1) P-3:** Have students complete Inspect and Adjust Shifting Controls Task Sheet.
 2. **Task Sheet ASE (A3-F-2) P-3:** Have students complete Inspect Front Locking Hubs Task Sheet.
 3. **Task Sheet ASE (A3-A-2) P-1, (A3-F-3) P-3:** Have students complete Transfer Case Lube Level Check Task Sheet.
 4. **Task Sheet ASE (A3-F-4) P-2, (A3-F-5) P-3:** Have students complete Four-Wheel Drive Diagnosis Task Sheet.
 5. **Task Sheet ASE (A3-F-7) P-2:** Have students complete Transfer Case Replacement Task Sheet.
 6. **Task Sheet ASE (A3-F-6) P-3:** Have students complete Transfer Case Electrical Components Task Sheet.
 7. **Task Sheet ASE (A3-F-7) P-2:** Have students complete Transfer Case Disassembly and Reassembly 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>)

- Dana 44/10 Bolt Locking Hub Install (time 6:13)
- Front axle U-Joint replace (time 7:47)
- Replace U-joint (time 2:27)
- Lockout hubs (time 6:14)
- Transmission/ transfer case rear seal replacement (time 7:29)
- Transfer case shift motor replacement (time 9:15)
- 4x4 front hub replacement (time 12:15)
- Transfer case part 1 (time 13:28)
- Transfer case part 2 (time 13:28)
- Audi Quattro (time 6:19)
- Subaru AWD (time 2:05)
- ZF AWD (time 1:38)
- Four-wheel drive (time 0:42)
- Transfer case (time 7:27)
- Transfer case repair (time 20:09)
- Transfer case fluid change (time 3:56)
- Transfer case repair (time 9:54)
- Transfer case chain (time 2:57)
- 4WD control diagnosis (time 8:30)
- Locking hub replacement (time 5:45)