

# Automotive Engines Theory and Servicing 10<sup>th</sup> Edition

## Chapter 13 – Cooling Systems Operation and Diagnosis

### Lesson Plan



#### **CHAPTER SUMMARY:**

1. Cooling System, Cooling System Operation, Thermostat, Radiators, and Pressure Caps
2. Coolant Recovery Systems, Water Pumps, Auxiliary Water Pumps, and Coolant Flow in the Engine
3. Cooling Fans, Heater Cores, Cooling System Testing, and Coolant Temperature Warning Light
4. Cooling System Inspection and Cooling System Service



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#### **OBJECTIVES:**

1. Explain the purpose and function of the cooling system, and cooling system operation.
2. Explain the purpose of thermostats, radiators, pressure caps, and water pumps.
3. Explain coolant flow in the engine and coolant recovery systems.
4. Explain the purpose of cooling fans and heater cores.
5. Describe cooling system testing and explain the purpose of a coolant temperature warning light.
6. Explain cooling system inspection and cooling system service.



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

1. Task Sheet: Engine Cooling System Inspection
2. Task Sheet: Radiator Testing with an Infrared Pyrometer
3. Task Sheet: Accessory Drive Belt Replacement
4. Task Sheet: Test and Replace Coolant
5. Task Sheet: Replace Water Pump
6. Task Sheet: Replace Thermostat
7. Task Sheet: Radiator Replacement
8. Task Sheet: Engine Fan Inspection and Testing
9. Chapter PowerPoint
10. [Crossword Puzzle and Word Search \(A1\)](#)
11. [Videos: \(A1\) Engine Repair](#)
12. [Animations: \(A1\) Engine Repair](#)



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#### **ACTIVITIES:**

1. Task Sheet: Engine Cooling System Inspection
  2. Task Sheet: Radiator Testing with an Infrared Pyrometer
  3. Task Sheet: Accessory Drive Belt Replacement
  4. Task Sheet: Test and Replace Coolant
  5. Task Sheet: Replace Water Pump
  6. Task Sheet: Replace Thermostat
  7. Task Sheet: Radiator Replacement
  8. Task Sheet: Engine Fan Inspection and Testing
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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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