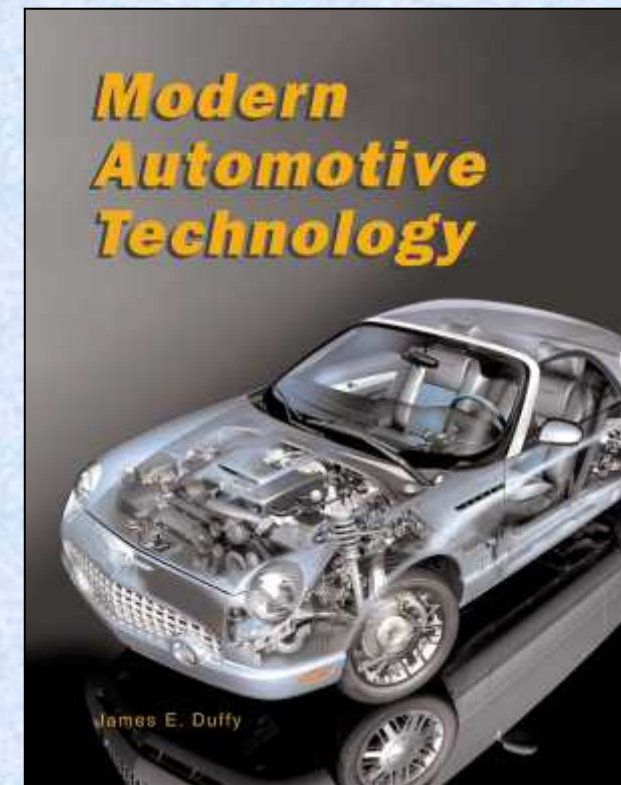


powerpoint for

# Modern Automotive Technology

by

**Russell Krick**



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# Chapter 2

## Automotive Careers and ASE Certification

# Contents

- The automotive technician
- Preparing for a career in automotive technology
- ASE certification
- Entrepreneurship

# The Automotive Technician

- Makes a living diagnosing, servicing, and repairing cars, vans, and light trucks
- Highly skilled and well trained
- Able to perform a wide variety of tasks

# General Job Classifications

- ❑ A wide variety of jobs are available in the automotive field
- ❑ Many of these jobs involve troubleshooting, service, and repair

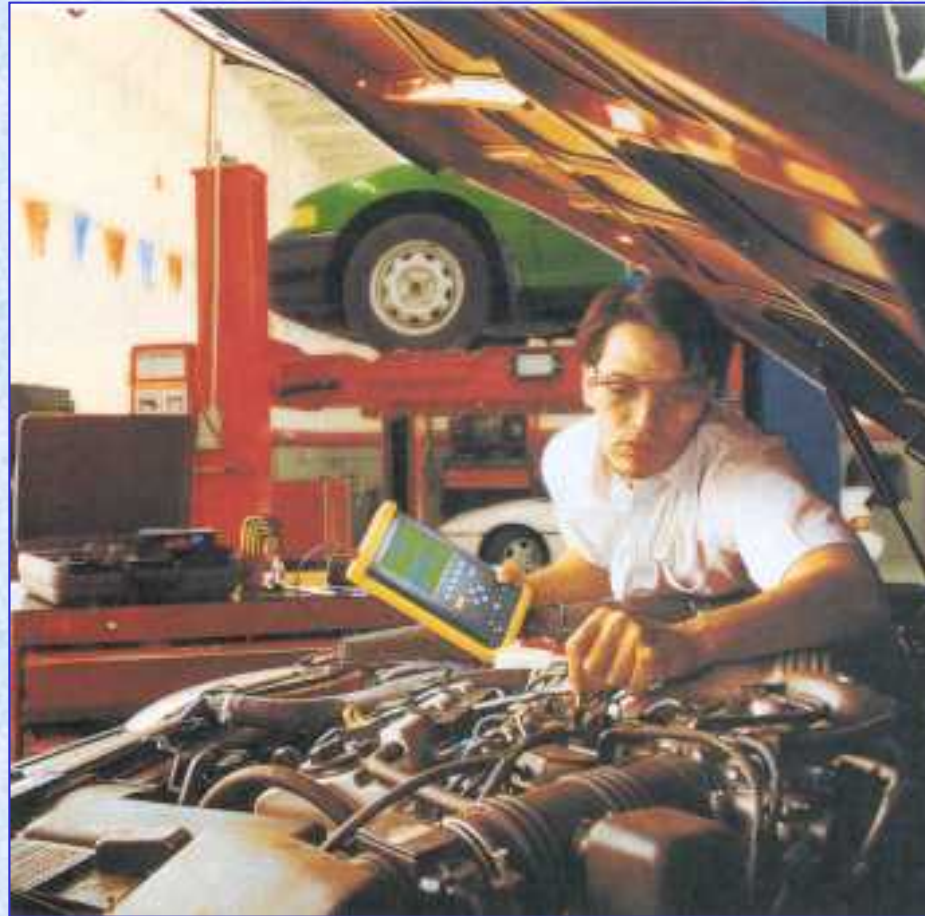
# Service Station Attendant

- Performs oil changes, grease jobs, and similar service tasks
- Requires little mechanical experience
- Provides an excellent learning experience

# Apprentice

- ❑ Learns automotive technology while working under the direction of an experienced technician
- ❑ Performs various tasks, such as:
  - picking up parts
  - cleaning parts
  - maintaining tools
  - helping with repairs

# Apprentice



An excellent way to learn the trade



# Specialized Technician

- ❑ Expert in one area of automotive repair
- ❑ Because of the increasingly complex nature of today's vehicles, the trend is toward specialization
- ❑ It is much easier to learn to repair one system than all systems

# Specialized Technician

## □ Common areas of specialization:

- engines
- transmissions
- steering and suspension
- brakes
- electrical
- heating and cooling
- driveability and performance
- lubrication

# Engine Technician

- ❑ Troubleshoots, services, and repairs automobile engines
- ❑ One of the most physically demanding automotive jobs
- ❑ Requires an individual who can lift heavy parts and easily torque large fasteners

# Engine Technician

Engine work requires a lot of skill. One mistake during assembly can be very costly.



# Transmission Technician

- ❑ Works on automatic and manual transmissions, transaxles, clutches, and sometimes, rear axle assemblies
- ❑ Must receive very specialized training and must frequently retrain

# Steering and Suspension Technician

- Responsible for checking, replacing, and adjusting steering and suspension components
- Uses specialized equipment, such as the wheel alignment rack
- May take care of tire and wheel problems

# Brake Technician

- ❑ Specializes in brake system service and repair
- ❑ One of the easiest jobs to master
- ❑ Jobs are available in both small and large shops, service stations, and tire outlets

# Brake Technician



This technician is machining a brake drum



# Electrical System Technician

- ❑ Tests and repairs lighting systems, charging systems, computer control systems, starting systems, and other electrical systems
- ❑ This specialty area requires less physical strength than other areas

# Electrical System Technician



This technician is using a digital voltmeter to measure battery voltage

# Heating and Air Conditioning Technician

- ❑ Troubleshoots, services, and repairs heaters, vents, and air conditioning systems
- ❑ Installs new air conditioning systems in vehicles
  - requires considerable skill

# Driveability and Performance Technician

- ❑ Tests and services the fuel, ignition, computer, and emission systems
- ❑ Uses special test equipment to keep engines in top running condition

# Driveability and Performance Technician



Using a diagnostic analyzer to find the source of engine performance problems

# Lubrication Specialist

- ❑ Changes engine oil, filters, and transmission fluid
- ❑ Checks various fluid levels and performs “grease jobs”
  - grease jobs involve lubricating pivot points on suspension and steering systems

# Master (General) Technician

- ❑ Experienced professional who has mastered all the specialized areas
- ❑ Capable of working on almost any part of a vehicle

# Shop Supervisor

- ❑ In charge of all the other technicians in the service facility
- ❑ Must be able to help others troubleshoot problems in all automotive areas
- ❑ Must communicate with the service manager, parts manager, and technicians



# Service Manager

- ❑ Responsible for the overall operation of a repair facility
- ❑ Must use a wide range of abilities to coordinate the efforts of all the shop personnel
- ❑ Handles customer complaints and ensures that the technicians are providing quality service

# Auto Parts Specialist

- ❑ Must have general knowledge of the components and systems of a vehicle
- ❑ Uses customer requests, parts catalogs, price lists, and parts interchange sheets to quickly and accurately find needed parts

# Service Writer (Advisor)

- Prepares work orders for vehicles entering the shop
- Greets customers and listens to descriptions of their problems
- Fills out the repair order, describing what might be wrong

# Service Dispatcher

- ❑ Must select, organize, and assign technicians to perform each auto repair
- ❑ Keeps track of all the repairs taking place in the shop

# Auto Salesperson

- ❑ Informs potential buyers of the features and equipment on a vehicle while trying to make a sale
- ❑ Positions are also available selling automotive-related parts and equipment

# Auto Salesperson

Sales people are representing manufacturers of parts and tools at this convention



# Automotive Designer

- ❑ Has art training and can make sketches or models of new body and part designs
- ❑ Employed by automobile manufacturers



# Automotive Engineer

- ❑ Designs new and improved automotive systems and parts
- ❑ Uses math, physics, and other advanced technologies
- ❑ Highly paid, college-trained individual with a working knowledge of the entire automobile



# Automotive Engineer



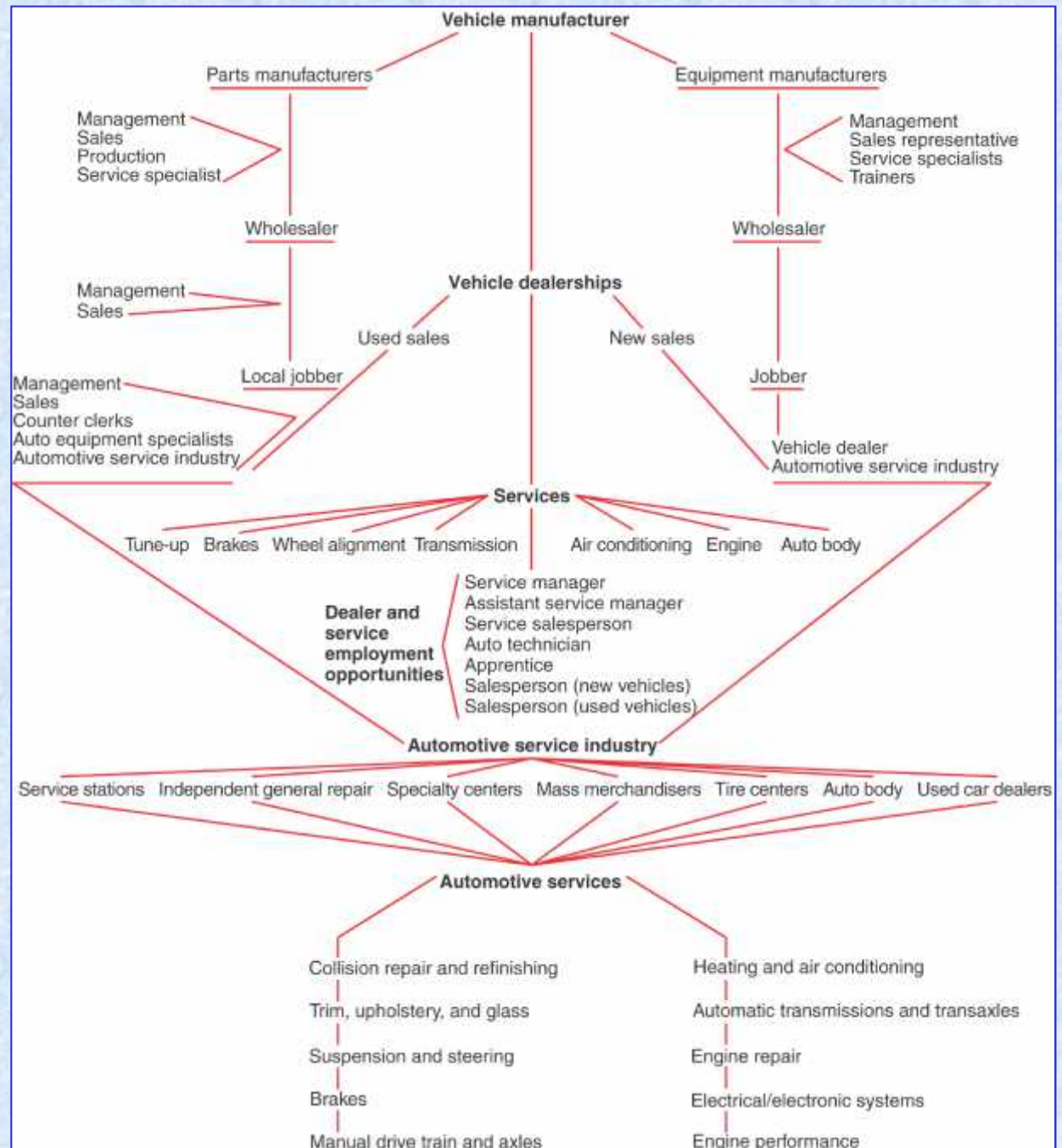
Most engineers have a bachelor's degree  
in a related discipline

# Automotive Instructor

- ❑ Experienced technician capable of sharing knowledge effectively
- ❑ Most instructors have a college degree



# Automotive Occupational Opportunities



# **Preparing for a Career in Automotive Technology**

# Career Preparations

- ❑ Many of the basic skills needed to succeed are learned in the classroom
- ❑ Automotive technicians must have above-average math and English skills
- ❑ Good verbal skills are required to effectively communicate with customers and other technicians

# Cooperative Training Programs

- Allow you to earn school credit and a wage by working in a commercial repair shop
- Ask your guidance counselor or automotive instructor about a training program in your school

# ASE Certification

- ❑ The National Institute for Automotive Service Excellence (ASE) is a nonprofit, nonaffiliated organization formed to help ensure the highest standards in automotive service
- ❑ ASE directs an organized testing and certification program

# ASE Certification

- ❑ Program in which persons take written tests to prove their knowledge of automotive technology
- ❑ Tests are voluntary
- ❑ Technicians take the tests for personal benefit and to show their employers and customers they are fully qualified



# Test Categories

- There are eight automotive categories:
  - engine repair
  - automatic transmission/transaxle
  - manual drive train and axles
  - suspension and steering
  - brakes
  - electrical/electronic systems
  - heating and air conditioning
  - engine performance

# Test Categories

- You can take any one or all of these tests
- Only four tests can be taken at one testing session (200 questions maximum)

# Automotive Test Categories

<b>Test title:</b>	<b>Test content:</b>
Engine repair (80 questions)	TEST A1 Valve train, cylinder head, and block assemblies; lubricating, cooling, ignition, fuel, exhaust, and battery and starting systems
Automatic transmission/transaxle (50 questions)	TEST A2 Controls and linkages; hydraulic and mechanical systems
Manual drive train and axles (40 questions)	TEST A3 Manual transmissions, clutches, front and rear drive systems
Suspension and steering (40 questions)	TEST A4 Manual and power steering, suspension systems, alignment, and wheels and tires
Brakes (55 questions)	TEST A5 Drum, disc, combination, and parking brake systems; power assist and hydraulic systems
Electrical/electronic systems (50 questions)	TEST A6 Batteries; starting, charging, lighting, and signaling systems; electrical instruments and accessories
Heating and air conditioning (50 questions)	TEST A7 Refrigeration, heating and ventilating, AC controls
Engine performance (70 questions)	TEST A8 Oscilloscopes and exhaust analyzers; emission control and charging systems; cooling, ignition, fuel and carburetion, exhaust, and battery and starting systems

# Certification Status

- ❑ ASE-certified automotive technician status is granted for each ASE test passed, provided the applicant has at least two years of experience as an automobile or truck technician
- ❑ Formal training may be substituted for all or part of the experience requirement
- ❑ ASE-certified master automobile technician status is granted when all eight automobile tests have been passed

# Certification Status

Sleeve or shirt patches and certificates are awarded for each test passed



# Applying for ASE Tests

- To acquire a registration booklet, send your name and address to:  
ASE Registration Booklet  
101 Blue Seal Drive, S.E.  
Leesburg, VA 20175
- Fill out the registration form found inside the booklet and mail it as directed
- Be sure to include a check or money order to cover all necessary fees

# Applying for ASE Tests

- ❑ Tests are given in the spring and fall of each year
- ❑ Test centers are located at over 300 facilities throughout the United States
- ❑ Most test centers are located at local colleges, high schools, or vocational schools

# Test-Taking Techniques

- Read each question carefully before deciding on a proper answer
- Select the most correct response
- Knowledge of general trade specifications will be required
- The time allowed for each test is usually about four hours



# Test Tips

- ❑ Read the statements or questions slowly
- ❑ Analyze the statement or question
- ❑ Analyze the question as if you were the technician trying to fix the car
- ❑ When two technicians give statements concerning a problem, try to decide if either is incorrect

# Test Tips

- Your first thought is usually the correct response
- Do not waste time on any one question
- Visualize yourself performing a test or repair when trying to answer a question

# Types of Test Questions

- ASE tests are designed to measure your knowledge of three things:
  - operation of various systems and components
  - diagnosis and testing of systems and components
  - repair of systems and components

# One-Part Questions

1. Which of the following components ignites the fuel in a gasoline engine?

(A) *Injector.*

(B) *Valve.*

(C) *Spark plug.*

(D) *Glow plug.*

The correct answer is (C) *Spark plug.*

# Two-Part Questions

1. Technician A says a locking rear differential assembly can be refilled with regular gear oil. Technician B says the differential assembly allows the vehicle to turn corners without wheel hop. Who is right?

*(A) A only.*

*(B) B only.*

*(C) Both A & B.*

*(D) Neither A nor B.*

The correct answer is *(B) B only.*

# Negative Questions

1. An engine contains all of the following bearings *except*:

(A) *connecting rod bearings.*

(B) *main crankshaft bearings.*

(C) *camshaft bearings.*

(D) *reverse idler bearings.*

The correct answer is *(D) reverse idler bearings.*

# Completion Questions

1. A torque wrench is used to measure:

*(A) twisting force on fasteners.*

*(B) shear applied to fasteners.*

*(C) horsepower applied to fasteners.*

*(D) transmission slip yoke angles.*

The correct answer is *(A) twisting force on fasteners.*

# Test Results

- ❑ Test scores will be mailed to your home a few weeks after you have completed the test
- ❑ Only you will find out how you did on the tests



# Recertification Tests

- ❑ You must take a recertification test every five years to maintain your certification
- ❑ Test questions concentrate on recent developments
- ❑ If you allow your certification to lapse, you must take the regular certification test(s) to regain your certification

# Entrepreneurship

An entrepreneur is someone who starts a business, such as a muffler shop, tune-up shop, parts house, or similar facility

# Entrepreneurial Qualities

- ❑ To be a good entrepreneur, you must be able to organize all aspects of the business:
  - bookkeeping
  - payroll
  - facility planning
  - hiring
- ❑ Most successful entrepreneurs have leadership qualities