

## 3

## Automotive Systems in ASE Format

### Objective

Students will be able to:



- Match the vehicle issues (concerns) with the appropriate specialty area that should address the given issue.

### Orienting Questions

- ✓ Do you know what the ASE Master Certification is?
- ✓ Do you know how many areas of certification there is?
- ✓ Do all areas just require a test to achieve certification?
- ✓ Why would you want to get the A9 certification?
- ✓ What areas are your strengths?
- ✓ Which areas do you think you will excel in?



Except where otherwise noted, this work was created by Jonathon Stewart and is licensed under the Creative Commons Attribution 4.0 Unported License. To view a copy of this license, visit <http://creativecommons.org/licenses/by/3.0/> or send a letter to Creative Commons, 444 Castro Street, Suite 900, Mountain View, California, 94041, USA.

\*\*\*Closed Captions and transcripts are available for all videos in this module. Click the  button at the bottom right of the play menu to turn on closed captions in the language of your choice. You may also read a full transcript of the video by clicking the  bottom of the play menu. If the YouTube closed captioning is not accurate, there will be an indication that the transcript is attached at the end of the module. \*\*\*\*



A black arrow pointing to the right inside a lavender circle is the symbol used for activities which are non-graded assignments.



A black arrow pointing to the right inside an orange circle is symbol for a graded assignment.



A black question mark in a lavender circle is the symbol for a practice test.



A black question mark in an orange circle is the symbol for a graded test.

**PRE-TEST**

Please take this pre-test to evaluate how much you already know about the Automotive Systems in ASE Format.

1. Which ASE section would you most likely hear the terms: pads, shoes, calipers, and rotors?
  - A. A7 Heating and Air Conditioning
  - B. A4 Steering and Suspension
  - C. A5 Brakes
  - D. A8 Engine Performance
2. Which term or terms are you not likely to discuss in A1 Engine Repair?
  - A. Pistons
  - B. Connecting Rods
  - C. Compressors
  - D. Valves
3. Which ASE section would you expect to use the following terms: refrigerant, orifice tube, expansion valve, and condenser?
  - A. A2 Automatic Transmission/Transaxle
  - B. A7 Heating and Air Conditioning
  - C. A5 Brakes
  - D. A8 Engine Performance
4. Which Term or Terms would you expect to hear in a section about A9 Light Vehicle Diesel Engines?
  - A. Modulator Valves
  - B. Proportioning Valves
  - C. Glow Plugs
  - D. Countershaft
5. Which ASE section would you expect to use the following terms: torque convertor, bands, planetary assembly, and valve body?
  - A. A2 Automatic Transmission/Transaxle

- B. A8 Engine Performance
  - C. A4 Steering and Suspension
  - D. A5 Brakes
6. Which term or terms would you not expect to hear in a section about A3 Manual Drivetrain and Axles?
- A. Synchronizer
  - B. Gear
  - C. Regulator
  - D. Clutch
7. Which ASE section would you expect to use the following terms: volts, ohms, amps, and circuits?
- A. A5 Brakes
  - B. A6 Electrical/Electronic Systems
  - C. A2 Automatic Transmission/Transaxle
  - D. A8 Engine Performance
8. Which Term or Terms would you expect to hear in a section about A8 Engine Performance?
- A. Throttle Position Sensor
  - B. Vehicle Speed Sensor
  - C. Fuel Injector
  - D. Differential
9. Which ASE section would you expect to use the following terms: caster, camber, toe, and struts?
- A. A5 Brakes
  - B. A4 Steering and Suspension
  - C. A3 Manual Drivetrain and Axles
  - D. A2 Automatic Transmission/Transaxle

## INTRODUCTION

Please click on the video 1 image to watch an introduction to this module.



Video 1 – Introduction (York Technical College, Public Domain)

Image of a man on a street

For a transcript of this video introduction, please click on [transcript](#).

INSTRUCTOR: For the embed code and line, please click on [code](#).

In this module you will be introduced to the nine major automotive systems using the format and coding of ASE. For each specialty area, you will see the ASE cod, the system name, and a brief description of the specialty area. The first eight specialty areas introduced are required to earn the ASE **Master Certification** as well as for a school to become NATEF accredited. The ninth area, A9 Light Vehicle Diesel Engines, which is a rapidly growing sector of the industry, is another area where you may want to pursue certification. In order to obtain certification in an area, not only must you study the test preparation materials, but you must also have at least two years of documented, hands-on work experience. The purpose of this module is to introduce you to the areas, not to prepare you for the testing.



Video 2 – ASE Master Certified Technicians: The Best of the Best (Colin Chester, Standard YouTube License)

For a transcript of this video, please click on [transcript](#).

Verbiage on image (plain background color) Automotive Procare ASE Master Certified Technicians: The Best of the Best  
www.AutomotiveProcare.com

### 3.1 A1 ENGINE REPAIR

**Engine Repair (A1)** examines the theory and operation of an internal combustion engine. In this specialty area students will be exposed to the different designs and components used in modern automotive engines. Included are illustrations of the proper disassembly, preparation, sealing, and reassembly of engines and engine components, as well as the identification of normal maintenance items and their correct intervals. The ASE certification exam for engine repair contains 50 questions involving the subject. Prior to deciding to pursue this specialty area certification, you must make sure that you are able to perform the following tasks:

- Identify engines and components
- Properly use precision measuring tools
- Properly diagnose engine concerns
- Properly perform engine repairs
- Properly advise customers of general maintenance
- Properly estimate the cost of repairs

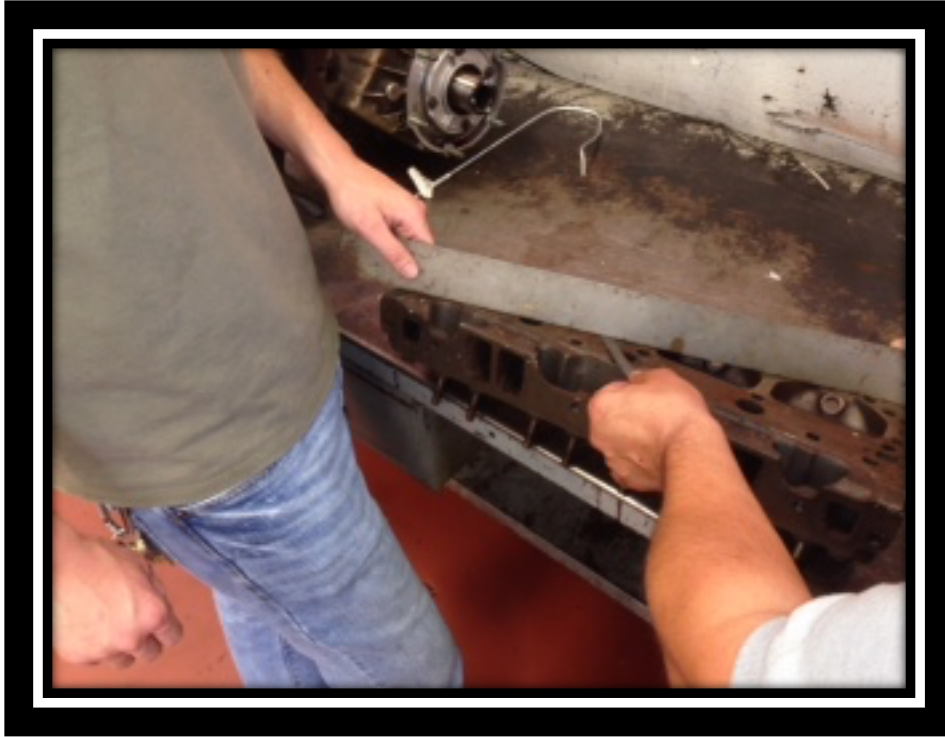


Figure 1 – photo 7 – Engine Repair (Jonathon Stewart, CC BY – NC – ND 2.0)

Image: An instructor an student looking at an engine repair.

To review the components of the A1 – Engine Repair Certification, please watch Video 3. You may access the video by clicking on the Video 3 image.



Video 3 – A1 Requirements (York Technical College, Public Domain)

For a transcript of this video, please click on [transcript](#).

For the embed code of this video, please click on [embed](#).

Image of man with a city view behind him



## ACTIVITY 1

Think about how this certification could assist you in getting a job with a small repair shop and a commercial repair shop. Would this certification provide more use in one or the other? Why or why not. Record your answers in a journal. (This is a non-graded activity, but will help you reflect on what you are learning and its application to your career.)

### 3.2 A2 AUTOMATIC TRANSMISSION/TRANSAXLE

The **Automatic Transmission/Transaxle (A2)** specialty area examines the theory and operation of an automatic transmission. This specialty area section illustrates the power flow as well the hydro-mechanical operation of a transmission or transaxle. You will be exposed to all of the internally lubricated components inside a transmission along with the torque convertor, and valve body. You will also examine and discuss proper

maintenance and service procedures. The ASE certification exam for automatic transmission/transaxle specialty area contains 50 questions.

Upon successful completion in of this specialty area you should be able to perform the following tasks:

- Identify transmission/transaxles and components
- Properly use precision measuring tools
- Properly measure electricity and pressure
- Properly diagnose transmission/transaxle concerns
- Properly perform transmission/transaxle repairs
- Properly advise customers of general maintenance
- Properly estimate the cost of repairs



Figure 2 – photo 6 – Auto Transmission (by Jonathon Stewart, CC BY – NC – ND 2.0)  
Image: Instructor and student an automobile transmission

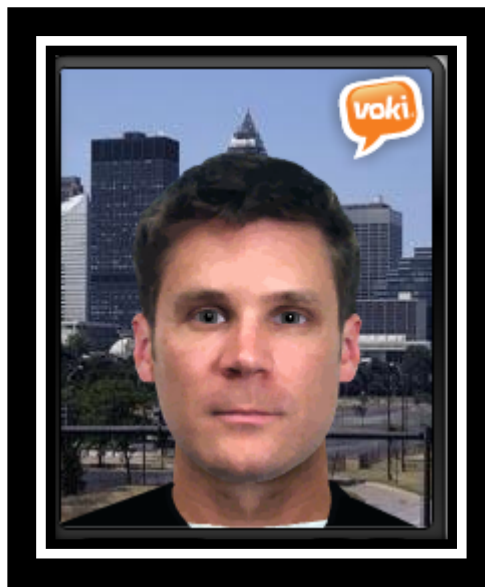


## ACTIVITY 2

Think about how this certification could assist you in getting a job with a small repair shop and a commercial repair shop. Would this certification provide more

use in one or the other? Why or why not. Record your answers in a journal. (This is a non-graded activity, but will help you reflect on what you are learning and its application to your career.)

To review the components of the A2 – Automatic Transmission/Transaxle Certification, please watch Video 4. You may access the video by clicking on the Video 4 image.



Video 4 – A2 Requirements (York Technical College, Public Domain)

For a transcript of this video, please click on [transcript](#).

For the embed code of this video, please click on [embed](#).

Image of man with a city view behind him

### 3.3 A3 MANUAL DRIVETRAIN & AXLES

The **manual drivetrain & axles (A3)** specialty area examines the theory and operation of manual transmissions/transaxles and drive axles. This specialty area illustrates the power flow of a manual transmission, transaxle and drive axle. You will be exposed to all of the internally lubricated components inside a transmission and axle. The manual drivetrain and axle specialty area also covers the fundamentals of clutches and differentials. You will also examine and discuss proper maintenance and service

procedure. The ASE certification exam for manual drivetrain and axles contains 40 questions.

Upon successful completion in of this section you should be able to perform the following tasks:

- Identify manual transmission/transaxles and components
- Identify drive axles and components
- Properly use precision measuring tools
- Properly diagnose transmission/transaxle and drive axle concerns
- Properly perform transmission/transaxle and drive axle repairs
- Properly advise customers of general maintenance
- Properly estimate the cost of repairs



Figure 3 – photo 2 - Differential (Jonathon Stewart, CC BY – NC – ND 2.0)  
Image: Student examining a differential



### ACTIVITY 3

Think about how this certification could assist you in getting a job with a small repair shop and a commercial repair shop. Would this certification provide more use in one or the other? Why or why not. Record your answers in a journal. (This is a non-graded activity, but will help you reflect on what you are learning and its application to your career.)

To review the components of the A3 – Manual Drivetrain & Axle Certification, please watch Video 5. You may access the video by clicking on the Video 5 image.



Video 5 – A3 Requirements (York Technical College, Public Domain)

For a transcript of this video, please click on [transcript](#).

For the embed code of this video, please click on [embed](#).

Image of man with a classroom behind him

### 3.4 A4 SUSPENSION AND STEERING

The **suspension and steering (A4)** specialty area examines the theory and operation of vehicle suspension and steering systems. This specialty area illustrates the different types of vehicle suspensions and steering systems. You will be exposed to the components used in each area. The suspension and steering specialty area also covers the fundamentals of ride quality, tires, and alignments. You will also examine and discuss the proper maintenance and service procedure. The ASE certification exam for suspension and steering contains 40 questions.

Upon successful completion in of this section you should be able to perform the following tasks:

- Identify suspension systems and components
- Identify steering systems and components

- Properly use vehicle alignment equipment
- Properly diagnose suspension and steering concerns
- Properly perform suspension and steering repairs
- Properly advise customers of general maintenance
- Properly estimate the cost of repairs



Figure 4 – photo 3 – Wheel Alignment (Jonathon Stewart, CC BY – NC – ND 2.0)  
Image: Instructor and student examining a wheel alignment.



#### ACTIVITY 4

Think about how this certification could assist you in getting a job with a small repair shop and a commercial repair shop. Would this certification provide more use in one or the other? Why or why not. Record your answers in a journal. (This is a non-graded activity, but will help you reflect on what you are learning and its application to your career.)

To review the components of the A4 – Suspension and Steering Certification, please watch Video 6. You may access the video by clicking on the Video 6 image.



Video 6 – A4 Requirements (York Technical College, Public Domain)

For a transcript of this video, please click on [transcript](#).

For the embed code of this video, please click on [embed](#).

Image of man with a classroom behind him

### 3.5 A5 BRAKES

The **brakes (A5)** specialty area examines the theory and operation of automotive braking systems. It covers the fundamentals of hydraulics and proper brake system operations including anti-lock braking systems. You will be exposed to different braking components and types of braking systems. Examination and discussion of proper maintenance and service procedure will be part of the specialty area. The ASE certification exam for suspension and steering contains 45 questions.

Upon successful completion in of this section you should be able to perform the following tasks:

- Identify braking systems and components
- Properly use brake tools and equipment
- Properly diagnose braking system concerns

- Properly perform braking system repair
- Properly advise customers of general maintenance
- Properly estimate the cost of repairs



Figure 5 – photo 4 - Brakes (Jonathon Stewart, CC BY – NC – ND 2.0)

Image: Student working on brakes



## ACTIVITY 5

Think about how this certification could assist you in getting a job with a small repair shop and a commercial repair shop. Would this certification provide more use in one or the other? Why or why not. Record your answers in a journal. (This is a non-graded activity, but will help you reflect on what you are learning and its application to your career.)

To review the components of the A5 – Brakes Certification, please watch Video 7. You may access the video by clicking on the Video 7 image.



Video 7 – A5 Requirements (York Technical College, Public Domain)

For a transcript of this video, please click on [transcript](#).

For the embed code of this video, please click on [embed](#).

Image of man with a street behind him

### 3.6 A6 ELECTRICAL/ELECTRONIC SYSTEMS

The **electrical/electronic systems (A6)** specialty area examines the theory and operation of automotive electrical and electronic systems. You will cover the fundamentals of electricity such as volts, amps, and ohms. The electrical/electronic systems specialty area also covers the principles of electronics and explains the numerous automotive uses. You will be exposed to the systems and components required for automotive use. Proper maintenance and service procedure will also be examined and discussed. The ASE certification exam for suspension and steering contains 50 questions.

Upon successful completion in of this section you should be able to perform the following tasks:

- Identify electrical/electronic systems and components
- Properly measure electricity

- Properly use electrical tools and equipment
- Properly diagnose electrical/electronic system concerns
- Properly perform electrical/electronic system repair
- Properly advise customers of general maintenance
- Properly estimate the cost of repairs



Figure 6 – photo1 – Electrical (Jonathon Stewart, CC BY – NC – ND 2.0)  
Image: People examining an automobile electrical system



## ACTIVITY 6

Think about how this certification could assist you in getting a job with a small repair shop and a commercial repair shop. Would this certification provide more use in one or the other? Why or why not. Record your answers in a journal. (This is a non-graded activity, but will help you reflect on what you are learning and its application to your career.)

To review the components of the A6 – Electrical and Electronic Systems Certification, please watch Video 8. You may access the video by clicking on the Video 8 image.



Video 8 – A6 Requirements (York Technical College, Public Domain)

For a transcript of this video, please click on [transcript.](#)

For the embed code of this video, please click on [embed.](#)

Image of man with a street behind him

### 3.7 A7 HEATING AND AIR CONDITIONING

The **heating and air conditioning specialty area (A7)** examines the theory and operation of automotive heating and air conditioning systems. In the A7 specialty area you will cover the fundamentals of refrigeration and heat transfer. You will also cover the proper delivery and distribution of climate control systems. You will be exposed to the different systems and components required for automotive use. Proper maintenance and service procedure will also be examined and discussed. The ASE certification exam for suspension and steering contains 50 questions.

Upon successful completion in of this section you should be able to perform the following tasks:

- Identify air conditioning systems and components
- Identify heating systems and components
- Properly measure electricity and pressure
- Properly use air conditioning tools and equipment

- Properly diagnose air conditioning and heating system concerns
- Properly perform air conditioning and heating system repair
- Properly advise customers of general maintenance
- Properly estimate the cost of repairs



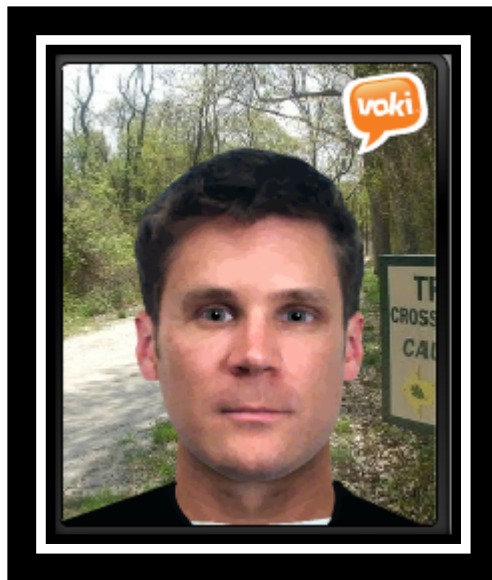
Figure 7 – photo8 – Automotive A/C (Jonathon Stewart, CC BY – NC – ND 2.0)  
Image: Student using instrument to measure automobile A/C



## ACTIVITY 7

Think about how this certification could assist you in getting a job with a small repair shop and a commercial repair shop. Would this certification provide more use in one or the other? Why or why not. Record your answers in a journal. (This is a non-graded activity, but will help you reflect on what you are learning and its application to your career.)

To review the components of the A7 – Electrical and Electronic Systems Certification, please watch Video 9. You may access the video by clicking on the Video 9 image.



Video 9 – A7 Requirements (York Technical College, Public Domain)

For a transcript of this video, please click on [transcript](#).

For the embed code of this video, please click on [embed](#).

Image of man with an unpaved road behind him

### 3.8 A8 ENGINE PERFORMANCE

The **engine performance (A8)** specialty area examines the theory and operation of automotive emissions, fuel, and ignition systems. This specialty area covers the fundamentals of fuel injection and electronically controlled ignition systems. The A8 specialty area also covers the proper operation vehicle emission or pollution control systems. You will be exposed to the different systems and components required for automotive use. You will examine and discuss the proper maintenance and service procedure. The ASE certification exam for suspension and steering contains 50 questions.

Upon successful completion in of this section you should be able to perform the following tasks:

- Identify engine performance systems and components
- Properly measure pressure and electricity
- Properly use diagnostic tools and equipment
- Properly diagnose engine performance concerns

- Properly perform engine performance repairs
- Properly advise customers of general maintenance
- Properly estimate the cost of repairs



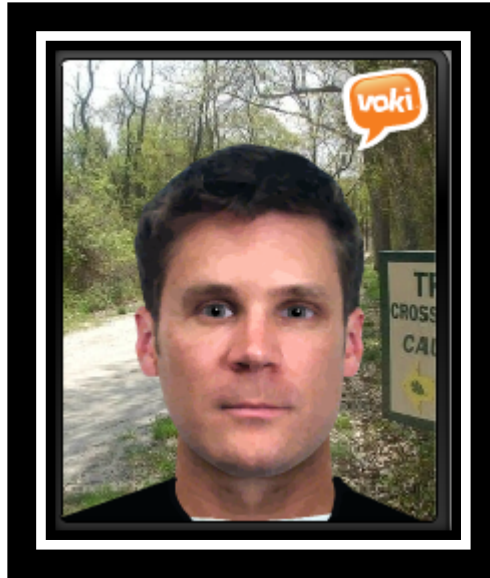
Figure 8 – photo5 (by Jonathon Stewart, CC BY – NC – ND 2.0)  
Image: Instructor and student examining the engine performance of an automobile



## ACTIVITY 8

Think about how this certification could assist you in getting a job with a small repair shop and a commercial repair shop. Would this certification provide more use in one or the other? Why or why not. Record your answers in a journal. (This is a non-graded activity, but will help you reflect on what you are learning and its application to your career.)

To review the components of the A8 – Engine Performance Certification, please watch Video 10. You may access the video by clicking on the Video 10 image.



Video 10 – A8 Requirements (York Technical College, Public Domain)

For a transcript of this video, please click on [transcript](#).

For the embed code of this video, please click on [embed](#).

Image of man with an unpaved road behind him

### 3.9 A9 LIGHT VEHICLE DIESEL ENGINES

The **light vehicle diesel engines (A9)** specialty area examines the theory and operation of non-commercial style diesel engines. The light vehicle diesel engines specialty area covers the fundamentals of diesel engines, diesel fuel injection and diesel emission controls. You will be exposed to the different systems and components required for automotive use. You will examine and discuss the proper maintenance and service procedure. The ASE certification exam for light vehicle diesel engines contains 50 questions. For certification for the A9 area, you must pass the test and have at least two years of documented, hands-on experience in the area. Experience is needed due to the nature of the test questions. You will need to be able to analyze the situation in order to answer the questions. The analysis skills for these type questions are gained through the experience.

Upon successful completion in of this section you should be able to perform the following tasks:

- Identify diesel engine systems and components

- Properly measure pressure and electricity
- Properly use diagnostic tools and equipment
- Properly diagnose diesel engine performance concerns
- Properly perform diesel engine and engine performance repairs
- Properly advise customers of general maintenance
- Properly estimate the cost of repairs



Figure 9 – I should have been a diesel mechanic (by Justin Watt, CC BY 2.0)

Image: Back of a diesel bus with a sign

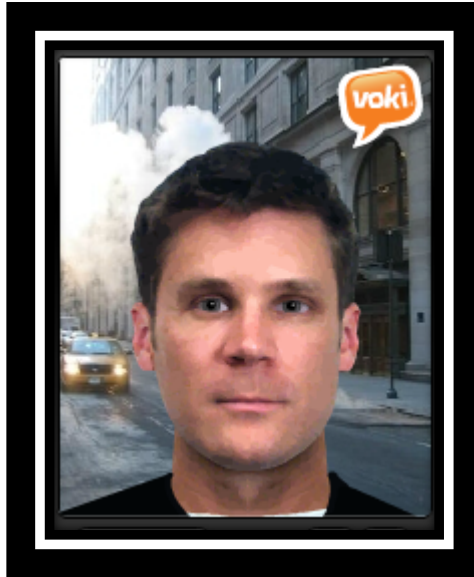
Sign Verbiage: Immediate Openings, Diesel Mechanics, Starting Salary \$71,500, Excellent Benefits, For applications visit [www.goldengate.org](http://www.goldengate.org) or call 415 – 257 – 4526



## ACTIVITY 9

Think about how this certification could assist you in getting a job with a small repair shop and a commercial repair shop. Would this certification provide more use in one or the other? Why or why not. Record your answers in a journal. (This is a non-graded activity, but will help you reflect on what you are learning and its application to your career.)

To review the components of the A9 – Light Vehicle Diesel Engines Certification, please watch Video 11. You may access the video by clicking on the Video 11 image.



Video 11 – A9 Requirements (York Technical College, Public Domain)

For a transcript of this video, please click on [transcript](#).

For the embed code of this video, please click on [embed](#).

Image of man with a downtown city street behind him



## ASSIGNMENT 1

A goal of qualified technicians is to become certified in all ASE specialty areas and achieving master status. Unfortunately for entry level technicians it is not practical to focus on all eight areas at once. What three ASE Specialty areas do you feel would be the most important for an entry level technician to attain? Explain how your choices would improve new technicians' chances to succeed in the automotive industry. (This is a graded assignment.)



## ASSIGNMENT 2

**Topic Relation Exercise****ASE Specialty Areas**

(A1) Engine Repair

(A2) Automatic  
Transmission/Transaxle

(A3) Manual Drivetrain &amp; Axles

(A4) Suspension and Steering

(A5) Brakes

(A6) Electrical/Electronic  
Systems

(A7) Heating and Air Conditioning

(A8) Engine Performance

(A9) Light Vehicle Diesel Engines

**Use the specialty area list to answer the following questions.**

1. Identify at least two ASE areas that may require an engine compression test to be performed.
2. Which specialty areas would be needed to diagnose a vehicle that is running properly but fails to move?
3. What specialty area would be needed to address an issue of irregular tire wear?
4. A customer states, "It is too hot in my vehicle" which specialty area would address this concern?
5. What specialty area would be needed to address a vehicle that stops poorly?
6. A customer suggests his clutch is slipping. What specialty area would be needed to address this concern?
7. Identify at least two specialty areas that may be needed to address a vehicle that is smoking from the exhaust pipe?
8. A vehicle stalled while driving what specialty areas would be needed to diagnose this concern?

9. What specialty area would be needed to diagnose an intermittent issue with an audio system?
10. A customer states his vehicle pulls right. Identify two specialty areas that could address this issue.

---

## TEST REVIEW

You must know:

- The A# with the title of the specialty area.
- Specific items covered in each area.
- Pay close attention to the bulleted items in each specialty area.



## POST-TEST

All problems are 5 points each.

1. Which ASE section would you most likely hear the terms: pads, shoes, calipers, and rotors?
  - A. A7 Heating and Air Conditioning
  - B. A4 Steering and Suspension
  - C. A5 Brakes
  - D. A8 Engine Performance
2. How many questions appear on the engine performance ASE certification exam?
  - A. 40
  - B. 45
  - C. 50
  - D. 60
3. (A9) Light Duty Diesel Engine Certification includes the service and repair of heavy duty equipment, and commercial trucks.
  - A. True
  - B. False
4. How many of the specialty areas require a student to correctly measure electricity?
  - A. 1
  - B. 2
  - C. 4
  - D. 6
5. Which ASE specialty area is not required for master certification?
  - A. (A1) Engine Repair
  - B. (A5) Brakes
  - C. (A9) Light Duty Diesel Engines
  - D. (A8) Engine Performance
6. How many ASE specialty areas require the ability to estimate repair costs?

- A. 1
  - B. 2
  - C. 6
  - D. 9
7. How many questions appear on the (A5) Brakes Certification Exam?
- A. 40
  - B. 45
  - C. 50
  - D. 60
8. Which term or terms are you not likely to discuss in A1 Engine Repair?
- A. Pistons
  - B. Connecting Rods
  - C. Compressors
  - D. Valves
9. Which ASE specialty area would you expect to use the following terms: refrigerant, orifice tube, expansion valve, and condenser?
- A. A2 Automatic Transmission/Transaxle
  - B. A7 Heating and Air Conditioning
  - C. A5 Brakes
  - D. A8 Engine Performance
10. Which Term or Terms would you expect to hear in a section about A9 Light Vehicle Diesel Engines?
- A. Modulator Valves
  - B. Proportioning Valves
  - C. Glow Plugs
  - D. Countershaft
11. Which ASE specialty area would you expect to use the following terms: torque convertor, bands, planetary assembly, and valve body?
- A. A2 Automatic Transmission/Transaxle
  - B. A8 Engine Performance
  - C. A4 Steering and Suspension
  - D. A5 Brakes

12. Which term or terms would you not expect to hear in a section about A3 Manual Drivetrain and Axles?
- A. Synchronizer
  - B. Gear
  - C. Regulator
  - D. Clutch
13. Which ASE specialty area would you expect to use the following terms: volts, ohms, amps, and circuits?
- A. A5 Brakes
  - B. A6 Electrical/Electronic Systems
  - C. A2 Automatic Transmission/Transaxle
  - D. A8 Engine Performance
14. Which Term or Terms would you expect to hear in a section about A8 Engine Performance?
- A. Throttle Position Sensor
  - B. Vehicle Speed Sensor
  - C. Fuel Injector
  - D. Differential
15. Which ASE specialty area would you expect to use the following terms: caster, camber, toe, and struts?
- A. A5 Brakes
  - B. A4 Steering and Suspension
  - C. A3 Manual Drivetrain and Axles
  - D. A2 Automatic Transmission/Transaxle
16. Batteries would be covered in the specialty area (A1) Engine Repair.
- A. True
  - B. False
17. In the (A1) Engine Repair image the cylinder head is being checked for condition?
- A. Cracks
  - B. Out of Round

- C. Wear
- D. Flatness

18. Which ASE specialty area would require the least amount of precision measuring?

- A. (A5) Brakes
- B. (A1) Engine Repair
- C. (A2) Automatic Transmission/Transaxle
- D. (A3) Manual Drivetrain & Axles

19. Why do you need to get the ASE Master certifications?

20. What do you need for the A9 Light Vehicle Diesel Engine certification and why?

## MAJOR CONCEPTS

### KEY CONCEPTS

- **A1** – Engine Repair – examines the theory and operation of an internal combustion engine.
- **A2** – Automobile Transmission/Transaxle – examines the theory and operation of an automatic transmission.
- **A3** – Manual Drivetrain and Axles – examines the theory and operation of manual transmissions/transaxles and drive axles.
- **A4** – Suspension and Steering – examines the theory and operation of vehicle suspension and steering systems.
- **A5** – Brakes – examines the theory and operation of automotive braking systems.
- **A6** – Electrical/Electronic Systems – examines the theory and operation of automotive electrical and electronic systems.
- **A7** – Heating and Air Conditioning – examines the theory and operation of automotive heating and air conditioning systems.
- **A8** – Engine Performance – examines the theory and operation of automotive emissions, fuel, and ignition systems.
- **A9** – Light Vehicle Diesel Engines – examines the theory and operation of non-commercial style diesel engines.
- **Master Certification** – is a specialty recognition issue by ASE upon the completion of areas A1-A8.

### KEY TERMS

**A1-** Engine Repair

**A2-** Automobile Transmission/Transaxle

**A3-** Manual Drivetrain and Axles

**A 4-** Suspension and Steering

**A5-** Brakes

**A6-** Electrical/Electronic Systems

**A7-** Heating and Air Conditioning

**A8-** Engine Performance

**A9-** Light Vehicle Diesel Engines

**Master Certification**

---

## GLOSSARY

[A1 – Engine Repair](#) – examines the theory and operation of an internal combustion engine.

[A2 – Automobile Transmission/Transaxle](#) – examines the theory and operation of an automatic transmission.

[A3 – Manual Drivetrain and Axles](#) – examines the theory and operation of manual transmissions/transaxles and drive axles.

[A4 – Suspension and Steering](#) – examines the theory and operation of vehicle suspension and steering systems.

[A5 – Brakes](#) – examines the theory and operation of automotive braking systems.

[A6 – Electrical/Electronic Systems](#) – examines the theory and operation of automotive electrical and electronic systems.

[A7 – Heating and Air Conditioning](#) – examines the theory and operation of automotive heating and air conditioning systems.

[A8 – Engine Performance](#) – examines the theory and operation of automotive emissions, fuel, and ignition systems.

[A9 – Light Vehicle Diesel Engines](#) – examines the theory and operation of non-commercial style diesel engines.

[Master Certification](#) – is a specialty recognition issue by ASE upon the completion of areas A1-A8.

**ASSESSMENT SOLUTIONS****ANSWERS TO PRE-TEST**

1. C
2. C
3. B
4. C
5. A
6. C
7. B
8. D
9. B

**ANSWERS TO ACTIVITIES****ACTIVITY 1**

Think about how this certification could assist you in getting a job with a small repair shop and a commercial repair shop. Would this certification provide more use in one or the other? Why or why not. Record your answers in a journal. (This is a non-graded activity, but will help you reflect on what you are learning and its application to your career.)

This is a reflection journal, so the answers will vary.

**ACTIVITY 2**

Think about how this certification could assist you in getting a job with a small repair shop and a commercial repair shop. Would this certification provide more use in one or the other? Why or why not. Record your answers in a journal. (This is a non-graded activity, but will help you reflect on what you are learning and its application to your career.)

This is a reflection journal, so the answers will vary.

---

### ACTIVITY 3

Think about how this certification could assist you in getting a job with a small repair shop and a commercial repair shop. Would this certification provide more use in one or the other? Why or why not. Record your answers in a journal. (This is a non-graded activity, but will help you reflect on what you are learning and its application to your career.)

This is a reflection journal, so the answers will vary.

---

### ACTIVITY 4

Think about how this certification could assist you in getting a job with a small repair shop and a commercial repair shop. Would this certification provide more use in one or the other? Why or why not. Record your answers in a journal. (This is a non-graded activity, but will help you reflect on what you are learning and its application to your career.)

This is a reflection journal, so the answers will vary.

---

### ACTIVITY 5

Think about how this certification could assist you in getting a job with a small repair shop and a commercial repair shop. Would this certification provide more use in one or the other? Why or why not. Record your answers in a journal. (This is a non-graded activity, but will help you reflect on what you are learning and its application to your career.)

This is a reflection journal, so the answers will vary.

---

### ACTIVITY 6

Think about how this certification could assist you in getting a job with a small repair shop and a commercial repair shop. Would this certification provide more use in one or the other? Why or why not. Record your answers in a journal. (This is a non-graded activity, but will help you reflect on what you are learning and its application to your career.)

This is a reflection journal, so the answers will vary.

---

### ACTIVITY 7

Think about how this certification could assist you in getting a job with a small repair shop and a commercial repair shop. Would this certification provide more use in one or the other? Why or why not. Record your answers in a journal. (This is a non-graded activity, but will help you reflect on what you are learning and its application to your career.)

This is a reflection journal, so the answers will vary.

---

### ACTIVITY 8

Think about how this certification could assist you in getting a job with a small repair shop and a commercial repair shop. Would this certification provide more use in one or the other? Why or why not. Record your answers in a journal. (This is a non-graded activity, but will help you reflect on what you are learning and its application to your career.)

This is a reflection journal, so the answers will vary.

---

### ACTIVITY 9

Think about how this certification could assist you in getting a job with a small repair shop and a commercial repair shop. Would this certification provide more use in one or the other? Why or why not. Record your answers in a journal. (This is a non-graded activity, but will help you reflect on what you are learning and its application to your career.)

This is a reflection journal, so the answers will vary.



## ANSWERS TO ASSIGNMENTS

---

### ASSIGNMENT 1

A goal of qualified technicians is to become certified in all ASE specialty areas and achieving master status. Unfortunately for entry level technicians it is not practical to focus on all eight areas at once. What three ASE Specialty areas do you feel would be

the most important for an entry level technician to attain? Explain how your choices would improve new technicians' chances to succeed in the automotive industry. (This is a graded assignment.)

Grading Rubric for Assignment 1

Criteria	Meets Expectations	Partially Meets Expectations	Does not meet expectations	Total points
<b>Knowledge</b>	Student has a clear understanding of the topic (40-30)	Student exhibits some understanding of the topic (29-16)	Student shows little to no understanding of the topic (15-0)	
<b>Analysis</b>	Student offers a concise rationale for their choices (40-30)	Student offers some rationale for their choices (29-16)	Student shows little to no rationale for their choices (15-0)	
<b>Spelling and Grammar</b>	Sentences are coherent; grammar/spelling errors are absent or rare (20-15)	Most sentences are coherent; few grammar/spelling errors (14-6)	Sentences are incoherent; numerous grammar/spelling errors (5-0)	
<b>Comments:</b>			<b>Total Points:</b>	

---

**ASSIGNMENT 2**

Correct solutions are listed below the exercise

**Topic Relation Exercise****ASE Specialty Areas**

(A1) Engine Repair

(A2) Automatic  
Transmission/Transaxle

(A3) Manual Drivetrain &amp; Axles

(A4) Suspension and Steering

(A5) Brakes

(A6) Electrical/Electronic  
Systems

(A7) Heating and Air Conditioning

(A8) Engine Performance

(A9) Light Vehicle Diesel Engines

**Use the specialty area list to answer the following questions.**

1. Identify at least two ASE areas that may require an engine compression test to be performed.
2. Which specialty areas would be needed to diagnose a vehicle that is running properly but fails to move?
3. What specialty area would be needed to address an issue of irregular tire wear?
4. A customer states, "It is too hot in my vehicle" which specialty area would address this concern?
5. What specialty area would be needed to address a vehicle that stops poorly?
6. A customer suggests his clutch is slipping. What specialty area would be needed to address this concern?
7. Identify at least two specialty areas that may be needed to address a vehicle that is smoking from the exhaust pipe?
8. A vehicle stalled while driving what specialty areas would be needed to diagnose this concern?
9. What specialty area would be needed to diagnose an intermittent issue with an audio system?

10. A customer states his vehicle pulls right. Identify two specialty areas that could address this issue.

Solutions:

- |               |               |
|---------------|---------------|
| 1. A1, A8, A9 | 6. A3         |
| 2. A2, A3     | 7. A1, A8, A9 |
| 3. A4         | 8. A8, A9     |
| 4. A7         | 9. A6         |
| 5. 5A5        | 10. A4, A5    |



## SOLUTIONS TO POST-TEST

1. C
2. C
3. B
4. C
5. C
6. D
7. C
8. C
9. B
10. C
11. A
12. C
13. B
14. D
15. B
16. B
17. D
18. A

19. Why do you need to get the ASE Master certifications?

- You need to pass all eight certification tests.
- The certifications give you a basic knowledge of the whole automobile.
- Gives you a better opportunity for employment.

20. What do you need for the A9 Light Vehicle Diesel Engine certification and why?

- You need to have two years of documented experience in the area.
- You need to pass the test
- The experience is necessary because the test is heavy rationalization and the experience is necessary for the rationalization.

## TRANSCRIPTS TO VIDEOS

### VIDEO 1 TRANSCRIPT – INTRODUCTION

Hi, I'm Jonathon, your Automotive Instructor.

In this module you will learn what the eight areas are in the ASE Master Certification. You will also review the up and coming area of A9 Light Vehicle Diesel Engines. This module will expose you to the topics in the certifications, but will not prepare you for the certification tests. Pay close attention to the name of the area and its code such as A1 is Engine Repair. This module will help you prepare for courses in automotive technology. Let's begin!

### VIDEO 1 EMBED CODE

Embed code for video: <object height="267" width="200" classid="clsid:D27CDB6E-AE6D-11cf-96B8-444553540000" codebase="http://download.macromedia.com/pub/shockwave/cabs/flash/swflash.cab#version=9,0,28,0" id="widget\_name"><param name="movie" value="http://vhss-d.oddcast.com/vhss\_editors/voki\_player.swf?doc=http://vhss-d.oddcast.com/php/vhss\_editors/getvoki/chsm=b78e6f70d0aef3a9169d970c6b48860a%26sc=10054605" /><param name="quality" value="high" /><param name="allowScriptAccess" value="always" /><param name="width" value="200" /><param name="height" value="267" /><param name="allowNetworking" value="all"/><param name="wmode" value="transparent" /><param name="allowFullScreen" value="true" /><embed height="267" width="200" src="http://vhss-d.oddcast.com/vhss\_editors/voki\_player.swf?doc=http%3A%2F%2Fvhss-

```
d.oddcast.com%2Fphp%2Fvhss_editors%2Fgetvoki%2Fchsm=b78e6f70d0aef3a9169d
970c6b48860a%26sc=10054605" quality="high" allowScriptAccess="always"
allowNetworking="all" wmode="transparent" allowFullScreen="true"
pluginspage="http://www.adobe.com/shockwave/download/download.cgi?P1_Prod_Ver
sion=ShockwaveFlash" type="application/x-shockwave-flash"
name="widget_name"></object>
```

## VIDEO 2 ASE MASTER CERTIFIED TECHNICIANS: THE BEST OF THE BEST

ASE Master Certified Technicians the best of the best when you bring your vehicle in for repair or even for a tune up you want to be assured that only the best and most capable hands work on it

ASE the National Institute for Automotive Service Excellence allows you to do just that ASE certified technicians are among the best master technicians in the business from general car maintenance to specialty repair they have their bases covered they prove this simply by achieving ASE certification but titles are nice what exactly is an ASE technician hands-on ASE tests to receive certification in any field you have to meet certain requirements for ASE technicians these requirements goal by field there are a number of different ways for a technician to become ASE certified most commonly certification goes by a group of tests specific to the type vehicles that that technician will be working on known as a series for instance a technician looking to become certified for working on school buses at the master level needs to pass six series of tests as well as tests on general car maintenance they have to know how to service the transmission change tires and replace brakes among other things each type a vehicle has its own set of qualification tests and all are designed to challenge even the most competent have technicians according to a SE's criteria listings they also require a minimum of two years a relevant hands-on experience in order to take the certification test this assures that the technician has the on-the-job experience which can differ greatly from school experience due to

the uncontrolled stay to the environment written ASE tests and continued Master Technicians

certification all ASE technicians are required to take a written proficiency test this is to ensure that they have not only the required technical skills but the required knowledge as well written tests cover a variety of subjects all related to the vehicle the technician is testing for questions very from potential solutions have problems too proper treatment of specific damages and can be multiple choices or written answers ASE technicians also have to renew their master certifications every five years to prevent them from expiring

this is to ensure that the technician is keeping up with the latest in repair work it also allows ASE to check if the technician is still competent and regular intervals tests are updated frequently to keep up with the current mechanical standards and practices so all technicians looking to receive Master Technician Certification are required to keep up with all updates in the automotive world finding an ASE technician if a Master Technicians certification is expired and you have a newer vehicle the technician may not have the knowledge to properly diagnose or fix it check online at a SEC's website before choosing a technician once you found one that you believe will do a good job look at consumer reports this will allow you to see whether or not the technician is renowned for good work that they're not don't bring your vehicle to their shop certification is great but it doesn't necessarily qualify the technician has the best for you.

### VIDEO 3 – A1 REQUIREMENTS - TRANSCRIPT

Successful in the ASE A1 Engine Repair certification requires that students successfully complete the following tasks:

- Identify engines and components
- Properly use precision measuring tools
- Properly diagnose engine concerns
- Properly perform engine repairs
- Properly advise customers of general maintenance
- Properly estimate the cost of repairs

### VIDEO 3 – A1 REQUIREMENTS EMBED CODE

```
<object height="267" width="200" classid="clsid:D27CDB6E-AE6D-11cf-96B8-444553540000" codebase="http://download.macromedia.com/pub/shockwave/cabs/flash/swflash.cab#version=9,0,28,0" id="widget_name"><param name="movie" value="http://vhss-d.oddcast.com/vhss_editors/voki_player.swf?doc=http://vhss-d.oddcast.com/php/vhss_editors/getvoki/chsm=b977514167c6beb0e6ecfeae00e34669%26sc=11616352" /><param name="quality" value="high" /><param name="allowScriptAccess" value="always" /><param name="width" value="200" /><param name="height" value="267" /><param name="allowNetworking" value="all"/><param name="wmode" value="transparent" /><param name="allowFullScreen" value="true" /><embed height="267" width="200" src="http://vhss-
```

```
d.oddcast.com/vhss_editors/voki_player.swf?doc=http%3A%2F%2Fvhss-  
d.oddcast.com%2Fphp%2Fvhss_editors%2Fgetvoki%2Fchsm=b977514167c6beb0e6e  
cfeae00e34669%26sc=11616352" quality="high" allowScriptAccess="always"  
allowNetworking="all" wmode="transparent" allowFullScreen="true"  
pluginspage="http://www.adobe.com/shockwave/download/download.cgi?P1_Prod_Ver  
sion=ShockwaveFlash" type="application/x-shockwave-flash"  
name="widget_name"></object>
```

#### VIDEO 4 – A2 REQUIREMENTS – TRANSCRIPT

Successful completion in the ASE A2 Automatic Transmission/Transaxle certification requires that students successfully complete the following tasks:

- Identify transmission/transaxles and their components
- Properly use precision measuring tools
- Properly measure electricity and pressure
- Properly diagnose transmission/transaxle concerns
- Properly perform transmission/transaxle repairs
- Properly advise customers of general maintenance
- Properly estimate the cost of repairs

#### VIDEO 4 – A2 REQUIREMENTS – EMBED CODE

```
<object height="267" width="200" classid="clsid:D27CDB6E-AE6D-11cf-96B8-  
444553540000"codebase="http://download.macromedia.com/pub/shockwave/cabs/flash  
/swflash.cab#version=9,0,28,0" id="widget_name"><param name="movie"  
value="http://vhss-d.oddcast.com/vhss_editors/voki_player.swf?doc=http://vhss-  
d.oddcast.com/php/vhss_editors/getvoki/chsm=4e3ab60bf78929ae5a4e85e8e1ba6ef9  
%26sc=11616362" /><param name="quality" value="high" /><param  
name="allowScriptAccess" value="always" /><param name="width" value="200"  
/><param name="height" value="267" /><param name="allowNetworking"  
value="all"/><param name="wmode" value="transparent" /><param  
name="allowFullScreen" value="true" /><embed height="267" width="200"  
src="http://vhss-  
d.oddcast.com/vhss_editors/voki_player.swf?doc=http%3A%2F%2Fvhss-  
d.oddcast.com%2Fphp%2Fvhss_editors%2Fgetvoki%2Fchsm=4e3ab60bf78929ae5a4e  
85e8e1ba6ef9%26sc=11616362" quality="high" allowScriptAccess="always"
```

```
allowNetworking="all" wmode="transparent" allowFullScreen="true"  
pluginspage="http://www.adobe.com/shockwave/download/download.cgi?P1_Prod_Ver  
sion=ShockwaveFlash" type="application/x-shockwave-flash"  
name="widget_name"></object>
```

## VIDEO 5 – A3 REQUIREMENTS – TRANSCRIPT

For successful completion in the ASE – A3 Certification in Manual Drivetrain and Axles students are required to successfully complete the following tasks:

- Identify manual transmission/transaxles and components.
- Identify drive axles and components.
- Properly use precision measuring tools.
- Properly diagnose transmission/transaxle and drive axle concerns.
- Properly perform transmission/transaxle and drive axle repairs.
- Properly advise customers of general maintenance.
- Properly estimate the cost of repairs.

## VIDEO 5 – A3 REQUIREMENTS – EMBED CODE

```
<object height="267" width="200" classid="clsid:D27CDB6E-AE6D-11cf-96B8-  
444553540000"codebase="http://download.macromedia.com/pub/shockwave/cabs/flash  
/swflash.cab#version=9,0,28,0" id="widget_name"><param name="movie"  
value="http://vhss-d.oddcast.com/vhss_editors/voki_player.swf?doc=http://vhss-  
d.oddcast.com/php/vhss_editors/getvoki/chsm=38b742be2f3649256a064a190496f02e  
%26sc=11616462" /><param name="quality" value="high" /><param  
name="allowScriptAccess" value="always" /><param name="width" value="200"  
/><param name="height" value="267" /><param name="allowNetworking"  
value="all"/><param name="wmode" value="transparent" /><param  
name="allowFullScreen" value="true" /><embed height="267" width="200"  
src="http://vhss-  
d.oddcast.com/vhss_editors/voki_player.swf?doc=http%3A%2F%2Fvhss-  
d.oddcast.com%2Fphp%2Fvhss_editors%2Fgetvoki%2Fchsm=38b742be2f3649256a06  
4a190496f02e%26sc=11616462" quality="high" allowScriptAccess="always"  
allowNetworking="all" wmode="transparent" allowFullScreen="true"  
pluginspage="http://www.adobe.com/shockwave/download/download.cgi?P1_Prod_Ver
```

sion=ShockwaveFlash" type="application/x-shockwave-flash"  
name="widget\_name"></object>

## VIDEO 6 – A4 REQUIREMENTS – TRANSCRIPT

Successful completion in the ASE A4 certification in Suspension and Steering require students to successfully complete the following tasks:

- Identify suspension systems and components.
- Identify steering systems and components.
- Properly use vehicle alignment equipment.
- Properly diagnose suspension and steering concerns.
- Properly perform suspension and steering repairs.
- Properly advise customers of general maintenance.
- Properly estimate the cost of repairs.

## VIDEO 6 – A4 REQUIREMENTS – EMBED CODE

```
<object height="267" width="200" classid="clsid:D27CDB6E-AE6D-11cf-96B8-444553540000" codebase="http://download.macromedia.com/pub/shockwave/cabs/flash/swflash.cab#version=9,0,28,0" id="widget_name"><param name="movie" value="http://vhss-d.oddcast.com/vhss_editors/voki_player.swf?doc=http://vhss-d.oddcast.com/php/vhss_editors/getvoki/chsm=0fc82735fbfd3836db82b22575ffaf49%26sc=11616495" /><param name="quality" value="high" /><param name="allowScriptAccess" value="always" /><param name="width" value="200" /><param name="height" value="267" /><param name="allowNetworking" value="all"/><param name="wmode" value="transparent" /><param name="allowFullScreen" value="true" /><embed height="267" width="200" src="http://vhss-d.oddcast.com/vhss_editors/voki_player.swf?doc=http%3A%2F%2Fvhss-d.oddcast.com%2Fphp%2Fvhss_editors%2Fgetvoki%2Fchsm=0fc82735fbfd3836db82b22575ffaf49%26sc=11616495" quality="high" allowScriptAccess="always" allowNetworking="all" wmode="transparent" allowFullScreen="true" pluginspage="http://www.adobe.com/shockwave/download/download.cgi?P1_Prod_Version=ShockwaveFlash" type="application/x-shockwave-flash" name="widget_name"></object>
```

---

## VIDEO 7 – A5 REQUIREMENTS – TRANSCRIPT

Successful completion in the ASE - A5 certification in brakes, require students to successfully complete the following tasks:

- Identify braking systems and components.
- Properly use brake tools and equipment.
- Properly diagnose braking system concerns.
- Properly perform braking system repair.
- Properly advise customers of general maintenance.
- Properly estimate the cost of repairs.

---

## VIDEO 7 – A5 REQUIREMENTS – EMBED CODE

```
<object height="267" width="200" classid="clsid:D27CDB6E-AE6D-11cf-96B8-444553540000" codebase="http://download.macromedia.com/pub/shockwave/cabs/flash/swflash.cab#version=9,0,28,0" id="widget_name"><param name="movie" value="http://vhss-d.oddcast.com/vhss_editors/voki_player.swf?doc=http://vhss-d.oddcast.com/php/vhss_editors/getvoki/chsm=a146263a8acdd97d1daad4e8c18a2957%26sc=11616526" /><param name="quality" value="high" /><param name="allowScriptAccess" value="always" /><param name="width" value="200" /><param name="height" value="267" /><param name="allowNetworking" value="all"/><param name="wmode" value="transparent" /><param name="allowFullScreen" value="true" /><embed height="267" width="200" src="http://vhss-d.oddcast.com/vhss_editors/voki_player.swf?doc=http%3A%2F%2Fvhss-d.oddcast.com%2Fphp%2Fvhss_editors%2Fgetvoki%2Fchsm=a146263a8acdd97d1daad4e8c18a2957%26sc=11616526" quality="high" allowScriptAccess="always" allowNetworking="all" wmode="transparent" allowFullScreen="true" pluginspage="http://www.adobe.com/shockwave/download/download.cgi?P1_Prod_Version=ShockwaveFlash" type="application/x-shockwave-flash" name="widget_name"></object>
```

---

## VIDEO 8 – A6 REQUIREMENTS – TRANSCRIPT

Successful completion in the ASE – A6 certification in electrical and electronic systems, require students to successfully complete the following tasks:

- Identify electrical and electronic systems and components.
- Properly measure electricity.
- Properly use electrical tools and equipment.
- Properly diagnose electrical and electronic system concerns.
- Properly perform electrical and electronic system repair.
- Properly advise customers of general maintenance.
- Properly estimate the cost of repairs.

#### VIDEO 8 – A6 REQUIREMENTS – EMBED CODE

```
<object height="267" width="200" classid="clsid:D27CDB6E-AE6D-11cf-96B8-444553540000" codebase="http://download.macromedia.com/pub/shockwave/cabs/flash/swflash.cab#version=9,0,28,0" id="widget_name"><param name="movie" value="http://vhss-d.oddcast.com/vhss_editors/voki_player.swf?doc=http://vhss-d.oddcast.com/php/vhss_editors/getvoki/chsm=b4ab76d807c369492ea40a85ecfc55c1%26sc=11616548" /><param name="quality" value="high" /><param name="allowScriptAccess" value="always" /><param name="width" value="200" /><param name="height" value="267" /><param name="allowNetworking" value="all"/><param name="wmode" value="transparent" /><param name="allowFullScreen" value="true" /><embed height="267" width="200" src="http://vhss-d.oddcast.com/vhss_editors/voki_player.swf?doc=http%3A%2F%2Fvhss-d.oddcast.com%2Fphp%2Fvhss_editors%2Fgetvoki%2Fchsm=b4ab76d807c369492ea40a85ecfc55c1%26sc=11616548" quality="high" allowScriptAccess="always" allowNetworking="all" wmode="transparent" allowFullScreen="true" pluginspage="http://www.adobe.com/shockwave/download/download.cgi?P1_Prod_Version=ShockwaveFlash" type="application/x-shockwave-flash" name="widget_name"></object>
```

#### VIDEO 9 – A7 REQUIREMENTS – TRANSCRIPT

Successful completion in the ASE – A7 Heating and air conditioning certification, require students to successfully complete the following tasks:

- Identify air conditioning systems and components.
- Identify heating systems and components.
- Properly measure electricity and pressure.
- Properly use air conditioning tools and equipment.

- Properly diagnose air conditioning and heating system concerns.
- Properly perform air conditioning and heating system repair.
- Properly advise customers of general maintenance.
- Properly estimate the cost of repairs.

#### VIDEO 9 A7 REQUIREMENTS – EMBED CODE

```
<object height="267" width="200" classid="clsid:D27CDB6E-AE6D-11cf-96B8-444553540000" codebase="http://download.macromedia.com/pub/shockwave/cabs/flash/swflash.cab#version=9,0,28,0" id="widget_name"><param name="movie" value="http://vhss-d.oddcast.com/vhss_editors/voki_player.swf?doc=http://vhss-d.oddcast.com/php/vhss_editors/getvoki/chsm=fe1a99f4e334fa6cc278dabd8e4583dd%26sc=11616601" /><param name="quality" value="high" /><param name="allowScriptAccess" value="always" /><param name="width" value="200" /><param name="height" value="267" /><param name="allowNetworking" value="all"/><param name="wmode" value="transparent" /><param name="allowFullScreen" value="true" /><embed height="267" width="200" src="http://vhss-d.oddcast.com/vhss_editors/voki_player.swf?doc=http%3A%2F%2Fvhss-d.oddcast.com%2Fphp%2Fvhss_editors%2Fgetvoki%2Fchsm=fe1a99f4e334fa6cc278dabd8e4583dd%26sc=11616601" quality="high" allowScriptAccess="always" allowNetworking="all" wmode="transparent" allowFullScreen="true" pluginspage="http://www.adobe.com/shockwave/download/download.cgi?P1_Prod_Version=ShockwaveFlash" type="application/x-shockwave-flash" name="widget_name"></object>
```

#### VIDEO 10 – A8 REQUIREMENTS – TRANSCRIPT

Successful completion in the ASE – A8, engine performance certification, requires students to successfully complete the following tasks:

- Identify engine performance systems and components.
- Properly measure pressure and electricity.
- Properly use diagnostic tools and equipment.
- Properly diagnose engine performance concerns.
- Properly perform engine performance repairs.
- Properly advise customers of general maintenance.

- Properly estimate the cost of repairs.

#### VIDEO 10 – A8 REQUIREMENTS – EMBED CODE

```
<object height="267" width="200" classid="clsid:D27CDB6E-AE6D-11cf-96B8-444553540000" codebase="http://download.macromedia.com/pub/shockwave/cabs/flash/swflash.cab#version=9,0,28,0" id="widget_name"><param name="movie" value="http://vhss-d.oddcast.com/vhss_editors/voki_player.swf?doc=http://vhss-d.oddcast.com/php/vhss_editors/getvoki/chsm=85172d5ba9adac850f145e139ac2f9c6%26sc=11616609" /><param name="quality" value="high" /><param name="allowScriptAccess" value="always" /><param name="width" value="200" /><param name="height" value="267" /><param name="allowNetworking" value="all"/><param name="wmode" value="transparent" /><param name="allowFullScreen" value="true" /><embed height="267" width="200" src="http://vhss-d.oddcast.com/vhss_editors/voki_player.swf?doc=http%3A%2F%2Fvhss-d.oddcast.com%2Fphp%2Fvhss_editors%2Fgetvoki%2Fchsm=85172d5ba9adac850f145e139ac2f9c6%26sc=11616609" quality="high" allowScriptAccess="always" allowNetworking="all" wmode="transparent" allowFullScreen="true" pluginspage="http://www.adobe.com/shockwave/download/download.cgi?P1_Prod_Version=ShockwaveFlash" type="application/x-shockwave-flash" name="widget_name"></object>
```

#### VIDEO 11 – A9 REQUIREMENTS - TRANSCRIPT

Successful completion in the ASE – A9, light vehicle diesel engines certification, require students to successfully complete the following tasks:

- Identify diesel engine systems and components.
- Properly measure pressure and electricity.
- Properly use diagnostic tools and equipment.
- Properly diagnose diesel engine performance concerns.
- Properly perform diesel engine and engine performance repairs.
- Properly advise customers of general maintenance.
- Properly estimate the cost of repairs.

#### VIDEO 11 – A9 REQUIREMENTS – EMBED CODE

```
<object height="267" width="200" classid="clsid:D27CDB6E-AE6D-11cf-96B8-444553540000" codebase="http://download.macromedia.com/pub/shockwave/cabs/flash/swflash.cab#version=9,0,28,0" id="widget_name"><param name="movie" value="http://vhss-d.oddcast.com/vhss_editors/voki_player.swf?doc=http://vhss-d.oddcast.com/php/vhss_editors/getvoki/chsm=5ef6ff76638a488619955122d8bdde06%26sc=11616642" /><param name="quality" value="high" /><param name="allowScriptAccess" value="always" /><param name="width" value="200" /><param name="height" value="267" /><param name="allowNetworking" value="all" /><param name="wmode" value="transparent" /><param name="allowFullScreen" value="true" /><embed height="267" width="200" src="http://vhss-d.oddcast.com/vhss_editors/voki_player.swf?doc=http%3A%2F%2Fvhss-d.oddcast.com%2Fphp%2Fvhss_editors%2Fgetvoki%2Fchsm=5ef6ff76638a488619955122d8bdde06%26sc=11616642" quality="high" allowScriptAccess="always" allowNetworking="all" wmode="transparent" allowFullScreen="true" pluginspage="http://www.adobe.com/shockwave/download/download.cgi?P1_Prod_Version=ShockwaveFlash" type="application/x-shockwave-flash" name="widget_name"></object>
```

# **ATtribution Table**

Link	Author/s & Dates	Title	Source	License
Video 1	York Technical College July 4, 2014	Introduction	<a href="http://www.voki.com/pickup.php?scid=10054605&amp;height=267&amp;width=200">http://www.voki.com/pickup.php?scid=10054605&amp;height=267&amp;width=200</a>	Public Domain
Video 2	Colin Chester	ASE Master Certified Technicians: The Best of the Best	<a href="https://www.youtube.com/watch?v=xGY5cFj3oH4">https://www.youtube.com/watch?v=xGY5cFj3oH4</a>	Standard YouTube License
Figure 1	Jonathan Stewart June 23, 2014	Photo7 - Engine Repair	<a href="https://www.flickr.com/photos/125390477@N05/14660306961/in/photostream/">https://www.flickr.com/photos/125390477@N05/14660306961/in/photostream/</a>	Creative Commons Attribution – NonCommerical – NoDerivs 2.0 Generic (CC BY – NC – ND 2.0)
Video 3	York Technical College July 24, 2015	A1 – Requirements	<a href="http://www.voki.com/pickup.php?scid=11616352&amp;height=267&amp;width=200">http://www.voki.com/pickup.php?scid=11616352&amp;height=267&amp;width=200</a>	Public Domain
Figure 2	Jonathan Stewart June 23, 2014	Photo6 – Auto Transmission	<a href="https://www.flickr.com/photos/125390477@N05/14476886629/in/photostream/">https://www.flickr.com/photos/125390477@N05/14476886629/in/photostream/</a>	Creative Commons Attribution – NonCommerical – NoDerivs 2.0 Generic (CC BY – NC – ND 2.0)
Video 4	York Technical College July 24, 2015	A2 – Requirements	<a href="http://www.voki.com/pickup.php?scid=11616362&amp;height=267&amp;wi">http://www.voki.com/pickup.php?scid=11616362&amp;height=267&amp;wi</a>	Public Domain

Link	Author/s & Dates	Title	Source	License
			<a href="#">dth=200</a>	
Figure 3	Jonathan Stewart June 23, 2014	Photo2 - Differential	<a href="https://www.flickr.com/photos/125390477@N05/14683411723/in/photostream/">https://www.flickr.com/photos/125390477@N05/14683411723/in/photostream/</a>	Creative Commons Attribution – NonCommerical – NoDerivs 2.0 Generic (CC BY – NC – ND 2.0)
Video 5	York Technical College July 24, 2015	A3 – Requirements	<a href="http://www.voki.com/pickup.php?scid=11616462&amp;height=267&amp;width=200">http://www.voki.com/pickup.php?scid=11616462&amp;height=267&amp;width=200</a>	Public Domain
Figure 4	Jonathan Stewart June 23, 2014	Photo3 – Wheel Alignment	<a href="https://www.flickr.com/photos/125390477@N05/14663154792/in/photostream/">https://www.flickr.com/photos/125390477@N05/14663154792/in/photostream/</a>	Creative Commons Attribution – NonCommerical – NoDerivs 2.0 Generic (CC BY – NC – ND 2.0)
Video 6	York Technical College July 24, 2015	A4 – Requirements	<a href="http://www.voki.com/pickup.php?scid=11616495&amp;height=267&amp;width=200">http://www.voki.com/pickup.php?scid=11616495&amp;height=267&amp;width=200</a>	Public Domain
Figure 5	Jonathan Stewart June 23, 2014	Photo4 - Brakes	<a href="https://www.flickr.com/photos/125390477@N05/14640534756/in/photostream/">https://www.flickr.com/photos/125390477@N05/14640534756/in/photostream/</a>	Creative Commons Attribution – NonCommerical – NoDerivs 2.0 Generic (CC BY – NC – ND 2.0)

Link	Author/s & Dates	Title	Source	License
Video 7	York Technical College July 24, 2015	A5 – Requirements	<a href="http://www.voki.com/pickup.php?scid=11616526&amp;height=267&amp;width=200">http://www.voki.com/pickup.php?scid=11616526&amp;height=267&amp;width=200</a>	Public Domain
Figure 6	Jonathan Stewart	Photo1 – Electrical	<a href="https://www.flickr.com/photos/125390477@N05/14683407003/in/photostream/">https://www.flickr.com/photos/125390477@N05/14683407003/in/photostream/</a>	Creative Commons Attribution – NonCommerical – NoDerivs 2.0 Generic (CC BY – NC – ND 2.0)
Video 8	York Technical College July 24, 2015	A6 – Requirements	<a href="http://www.voki.com/pickup.php?scid=11616548&amp;height=267&amp;width=200">http://www.voki.com/pickup.php?scid=11616548&amp;height=267&amp;width=200</a>	Public Domain
Figure 7	Jonathan Stewart June 23, 2014	Photo8 Automotive A/C	<a href="https://www.flickr.com/photos/125390477@N05/14640544096/in/photostream/">https://www.flickr.com/photos/125390477@N05/14640544096/in/photostream/</a>	Creative Commons Attribution – NonCommerical – NoDerivs 2.0 Generic
Video 9	York Technical College July 24, 2015	A7 – Requirements	<a href="http://www.voki.com/pickup.php?scid=11616601&amp;height=267&amp;width=200">http://www.voki.com/pickup.php?scid=11616601&amp;height=267&amp;width=200</a>	Public Domain
Figure 8	Jonathan Stewart June 23, 2014	Photo5 – Engine Performance	<a href="https://www.flickr.com/photos/125390477@N05/14663517995/in/photostream/">https://www.flickr.com/photos/125390477@N05/14663517995/in/photostream/</a>	(CC BY – NC – ND 2.0)
Video 10	York Technical College	A8 – Requirements	<a href="http://www.voki.com/pickup.php?scid=1161">http://www.voki.com/pickup.php?scid=1161</a>	Public Domain

Link	Author/s & Dates	Title	Source	License
	July 24, 2015		<a href="#">6609&amp;height=267&amp;width=200</a>	
Figure 9	Justin Watt April 20, 2008	I should have been a diesel mechanic	<a href="https://www.flickr.com/photos/justinsomnia/2430694120/in/photolist-4GMWFj-4N13h2-7nhtFF-3pEQGJ-chfUjd-e7yJsK-7eJ3G8-oYUqa-dPEkhY-78TxVx-5i3bMk-91cTJ5-85rB6g-6ECLTb-bDJ58G-72chtW-5uMtde-boi3x1-ccZvdu-5kHEaN">https://www.flickr.com/photos/justinsomnia/2430694120/in/photolist-4GMWFj-4N13h2-7nhtFF-3pEQGJ-chfUjd-e7yJsK-7eJ3G8-oYUqa-dPEkhY-78TxVx-5i3bMk-91cTJ5-85rB6g-6ECLTb-bDJ58G-72chtW-5uMtde-boi3x1-ccZvdu-5kHEaN</a>	Creative Commons Attribution 2.0 Generic (CC BY 2.0)
Video 11	York Technical College July 24, 2015	A9 – Requirements	<a href="http://www.voki.com/pickup.php?scid=11616642&amp;height=267&amp;width=200">http://www.voki.com/pickup.php?scid=11616642&amp;height=267&amp;width=200</a>	Public Domain



This workforce solution was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The solution was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites, and including, but not limited to accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability or ownership.

**SC ACCELERATE**

Open Text

AUT 161 – Introduction to  
Automobile Maintenance

Module 3- Automotive Systems in  
ASE Format

---