

VEHICLE MAINTENANCE AND FLUID SERVICE

Revised 1999

Introduction

This video will explain and demonstrate the essential maintenance procedures used to prolong the life of an automobile. Performing regular maintenance checks on your car should be an important priority. An automobile is an expensive investment. It makes good practical and business sense to maintain it. In this program you will learn to perform basic service techniques normally designed to extend the service-life of an automobile. You will learn how to perform an under hood inspection, which will enable you to detect many potential problems in the engine compartment of your car. This film will provide you with the knowledge needed to properly change your automobile engine's oil and oil filter. Also, this tape will summarize the several different automotive systems which require periodic fluid service. Finally, this video allows you to observe the proper methods used to inspect automotive brake and suspension systems. Remember, driving a car is simple; maintaining a car is smart.



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Student Objectives

After viewing this video, the student will be able to:

- Identify faulty wires, linkages and hoses in the engine compartment of an automobile
- Inspect an automobile's fuel system for leaks
- Identify possible problems with an automobile engine's cooling system
- Properly service the battery in an automobile
- Change a car's engine oil and oil filter
- Check an automobile's brake system and fluid level
- Describe the procedures used to check a car's power steering fluid
- Explain how to check an automobile's automatic transmission/transaxle fluid
- Inspect an automobile's exhaust system for problems
- Properly inspect the condition of a car's tires and suspension system

To The Instructor

This video is designed to be a valuable supplement to your curriculum. Since young people are extremely acclimated to television, it is a natural way to help present important aspects of your subject matter. This video is designed to give a detailed, yet broad coverage of the topic.

Most educators agree that it is best to use as many instructional methods as possible. Utilize quality textbooks, workbooks, videos, lectures, demonstrations, overheads, and other methods to present the technical information. This will hold interest and help pupils understand the large amount of information required to succeed in today's complex world.

This video is organized into major sections or topics. Each section covers one major segment of the subject. Graphic breaks are given between each section so that you can stop the video for class discussion, demonstrations, to answer questions, or to ask questions. This allows you to only watch a portion of the program each day or to present the complete video, depending on your curriculum requirements.

The video is designed to simplify the complex. Concise wording and carefully selected graphics are used to provide maximum learning in minimum time.

Close-up shots of components and service procedures are used to make instructional, as if each student was standing right behind you, watching were working or giving a demonstration.

Computer animation is used to explain difficult to comprehend principles or techniques. These images show how parts work, how they fit together, or how they vary in design.

Quiz Answer Key

1. d 2. b 3. c 4. b 5. b 6. a 7. d 8. c 9. c 10. d 11. b 12. a
13. b 14. d 15. c

ASE Answer Key

1. c 2. c 3. b 4. a 5. b 6. b 7. a 8. a 9. b 10. d

Use your own judgment to evaluate the definitions, short answer questions and discussion topics.

Technical Terms

Write definitions for the following terms. Use a textbook or review the video if needed.

radiator	engine oil filter	fluid
radiator hoses	jack stands	manual transmission fluid
engine belts	automobile lift	rear axle fluid
engine air cleaner	oil pan drain plug	engine exhaust system
vacuum hoses	oil pan drain plug seal	engine muffler
fuel injected engine	engine coolant	shock absorber bushings
injectors	open cooling system	front wheel drive
throttle linkage	hydrometer	oil pan gasket
fuel pressure regulator	closed cooling system	front drive axles
automotive battery	closed cooling system	CV-joints
battery cables	engine firewall	CV-joint boot
battery post terminals	automotive brake system	front brake pads
box wrench	reservoir tank	suspension system
battery pliers	brake system fluid	strut assembly
battery terminal tool	master cylinder	strut bearing
white grease	master cylinder cover	ball socket
side post battery	power steering fluid	sway bar bushings
wire brush	power steering pump	wheel lug nuts
side post tool	differential	tire wear gauge
engine oil	manual steering lubricant	tire pressure gauge
oil dipstick	manual steering gearbox	
engine crankshaft	automatic transmission	

Video Discussion Topics

Here are a few topics that might be used for a class discussion:

1. How can periodic maintenance inspections prolong the service life of your automobile?
2. What type of problems should you look for during cooling system inspection?
3. Does it matter if you add too much oil to an engine?
4. What type of problems can result from an overtightened oil pan drain plug?
5. What should an exhaust system inspection consist of?
6. Why is it important to regularly check the condition of your automobile's steering components?
7. Why should old and new hose shapes and lengths match perfectly?
8. How can a damaged CV-joint "boot" affect CV-joint operation?

Video Quiz

Choose the most correct answer after reading the statement:

1. Warm the engine or pressurize the engine _____ system while checking for signs of leakage.
a. intake b. exhaust c. charging d. cooling
2. A _____ battery cable connection causes a voltage drop that leaves less current to operate the starting motor.
a. good b. poor c. clean d. dry
3. Wash the top of an automotive _____ with soap and water or baking soda and water.
a. starter b. compressor
c. battery d. transmission
4. A _____ can be used to measure engine coolant strength and freeze-up protection.
a. screwdriver b. hydrometer
c. hose d. micrometer
5. To check an automobile's brake system fluid, inspect the fluid level in the _____ cylinder on the driver's side of the engine firewall.
a. manifold b. master c. engine d. wheel
6. To check an automobile's power steering fluid level, the engine must be _____.
a. off b. running c. cranking d. raised
7. To check an automobile's automatic transmission fluid level, use the _____, normally at the rear of the engine.
a. window b. level c. valve d. dipstick
8. To check a car's rear axle fluid, remove the plug on the side of the _____.
a. engine b. bearing c. differential d. manifold.
9. What should the actual pressure of a tire be if its maximum inflation pressure is thirty-four psi?
a. forty psi b. twenty psi
c. thirty-two psi d. twenty-five psi
10. Use a _____ to check for rusted pipes on an automotive exhaust system.
a. drill b. straight edge
c. micrometer d. hammer
11. Wiggle the steering wheel to check for _____ in the steering component.
a. grinding b. play c. tightness d. leakage

12. To check an engine's oil level, the engine should be _____ but not running.
a. warm b. cold c. cranking d. elevated
13. Use a _____ to add oil to an engine to prevent spillage.
a. cup b. funnel c. jar d. hose
14. When changing an engine's oil and filter, use a _____ wrench to unscrew the old oil filter.
a. box b. steel c. seal d. filter
15. Always wipe clean motor oil on the oil filter _____ to assure complete oil filter installation.
a. body b. bolt c. seal d. nut

Short Answer

Briefly answer the following questions in your own words:

1. How can a dirty battery top affect the performance of an automotive battery?
2. What type of tools should you use to install an oil filter?
3. Explain how to add coolant to a cooling system.
4. Why is it important to use a clean funnel when adding brake fluid to an automotive brake system?
5. What type of fluid is normally used in most automotive power steering systems?
6. How do you usually check the fluid in a manual transmission?
7. What type of problems should you look for during shock absorber inspection?
8. What is the purpose of a CV-joint boot?
9. Describe one method of checking for "ball socket wear" on an automotive suspension system.
10. What problems should you look for during an automotive tire inspection?

ASE Questions

Choose the correct answer to the following questions.

1. Coolant is leaking from an automobile engine. Technician A pressurizes the engine's cooling system and checks around all system fittings and hose ends to determine the source of the leak. Technician B warms the engine to full operating temperature and checks around all system fittings and hose ends to determine the source of the leak. Who is right?
 - a. Technician A only
 - b. Technician B only
 - c. Both A and B are correct
 - d. Neither A nor B is correct
2. The top of an automobile's battery is covered with an acid residue. Technician A washes the battery top with soap and water and then dries the battery top with a shop rag. Technician B washes the battery with baking soda and water and then dries the battery with a shop rag. Who is right?
 - a. Technician A only
 - b. Technician B only
 - c. Both A and B are correct
 - d. Neither A nor B is correct
3. Technician A says a pyrometer can be used to check an automotive cooling system's antifreeze strength and freeze up protection. Technician B says a hydrometer can be used to check a cooling system's antifreeze strength and freeze up protection. Who is right?
 - a. Technician A only
 - b. Technician B only
 - c. Both A and B are correct
 - d. Neither A nor B is correct
4. Technician A says during automobile engine belt installation, a pry bar may be needed to tighten the belt or compress the tensioner spring. Technician B says during belt installation, a pry bar should not be used to tighten the belt or compress the tensioner spring. Who is right?
 - a. Technician A only
 - b. Technician B only
 - c. Both A and B are correct
 - d. Neither A nor B is correct
5. Technician A says an automobile's master cylinder is normally located on the passenger's side of the engine firewall. Technician B says an automobile's master cylinder is normally located on the driver's side of the engine firewall. Who is right?
 - a. Technician A only
 - b. Technician B only
 - c. Both A and B are correct
 - d. Neither A nor B is correct
6. The fluid level in an automobile's power steering pump requires inspection. Technician A is going to check the pump's fluid level with the engine running. Technician B is going to check the power steering pump's fluid level with the engine off. Who is right?
 - a. Technician A only
 - b. Technician B only
 - c. Both A and B are correct
 - d. Neither A nor B is correct

7. A manual transmission's gear oil level is even with the drain bolt hole. Technician A says this is the proper level for the transmission's gear oil. Technician B says the transmission's gear oil level is too high. Who is right?
- a. Technician A only
 - b. Technician B only
 - c. Both A and B are correct
 - d. Neither A nor B is correct
8. Technician A checks an automobile's automatic transmission fluid level with the engine running and the transmission in park. Technician B checks the transmission fluid level with the engine off and the car's transmission in neutral. Who is right?
- a. Technician A only
 - b. Technician B only
 - c. Both A and B are correct
 - d. Neither A nor B is correct
9. Some play is discovered in a late model automobile's steering components during a routine inspection. Technician A says this is a normal steering system condition. Technician B says steering component play indicates possible steering system problems. Who is right?
- a. Technician A only
 - b. Technician B only
 - c. Both A and B are correct
 - d. Neither A nor B is correct
10. Technician A says when checking an automobile engine's oil level, the engine should be warm and running. Technician B says when checking an automobile engine's oil level, the engine should be cold and off. Who is right?
- a. Technician A only
 - b. Technician B only
 - c. Both A and B are correct
 - d. Neither A nor B is correct

We Need Your Help

We are constantly trying to improve our videos. If you have any suggestions or comments, please send them to us with details (title, time code location, etc.) of any potential improvement. We will try to incorporate suggestions when revising our videos. Your help will be greatly appreciated. We want to help you train America's youth!