

AUTOMOTIVE SERVICE INTRODUCTION (505)

DESCRIPTION

This is an entry-level course in Automotive Service. Through demonstrations, lectures, research and practical experiences is designed to introduce the student to abroad experience in the use of: equipment, tools, materials, processes and techniques of automotive service. This is a one-semester course of instruction.

Total Test Questions: 57

Levels: Grades 10-12

Units of Credit: 0.5

Prerequisites: None

STANDARDS, OBJECTIVES, AND INDICATORS

STANDARD 1

◆ UNDERSTAND GENERAL SHOP SAFETY (SP2 OPTIONAL).

Objective 1: Learn safe working habits and procedures. Pass a safety test with 100 percent.

1. Personal safety.
2. Tool and equipment safety.
3. Workplace safety.
4. Personal protective equipment (PPE).

Objective 2: Comply with safety rules for working with automotive chemicals.

1. Identify the location of the safety data sheets (SDS).
2. Navigate through the SDS for critical information.
3. Store chemicals in properly labeled containers.

Objective 3: Identify the gasses encountered in the automotive field and the hazards they present.

1. Water, oxygen, nitrogen, carbon dioxide(CO₂), hydrocarbons(HC), oxides of nitrogen (NO_x), and carbon monoxide (CO).
2. HC, NO_x, and CO can pose health and environmental problems if they are not controlled.

Objective 4: Identify the hazards and control of asbestos dust.

1. Asbestos is a carcinogen – a substance that causes cancer.
2. Never use compressed air to clean brake assemblies.
3. Use an approved brake vacuum or brake washer machine.

STANDARD 2

◆ STUDENTS WILL BE ABLE TO UNDERSTAND BASIC HAND TOOLS, FASTENERS, AND SHOP EQUIPMENT.



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- Objective 1: Identify and measure metric and standard fasteners.
1. Machine screws, sheet metal screws, bolts, studs, nuts, washers.
 2. Head markings, nominal size, thread pitch(TPI).
- Objective 2: Correctly identify and use basic hand tools.
1. Screwdrivers, wrench, sockets, drive handles, extensions, pliers, hammer, chisels, punches, files, hacksaw, taps, dies, basic pneumatic tools.
 2. Describe the use of each of the above tools.
- Objective 3: Identify and demonstrate use of basic measuring tools (accurate to 1/32 or 1mm).
1. Tire pressure gauges.
 2. Tread depth gauge.
 3. Feeler gauge.
 4. Brake thickness gauge.
- Objective 4: Complete a repair order including cause, concern, and correction, use reference manuals or information systems to find service procedures and specifications.
1. Repair order.
 2. Access service information.
- Objective 5: Locate proper lift points, raise and support the vehicle using jack stands and a vehicle hoist.
1. Use a jack and jack stands to raise and support a vehicle.
 2. Use a hoist to raise and support a vehicle and properly use safety locks to •secure the vehicle.

STANDARD 3

◆ **STUDENTS WILL BE ABLE TO IDENTIFY AND PERFORM BASIC SERVICES ON A VEHICLE.**

- Objective 1: Inspect tires for abnormal wear.
1. Proper inflation
 2. Mechanical problems (no specific angles)
- Objective 2: Dismount, inspect, and remount a tire on a wheel (including TPMS).
1. Use the proper equipment.
 2. Use the correct techniques and safety precautions.
- Objective 3: Properly rotate tires and reinstall using proper torque procedures.
1. Use either the conventional or directional tire rotation method.
 2. Lug nuts should be tightened to the proper torque as indicated in the vehicle specifications and in a sequence of cross or star patterns depending on the number of lug nuts.



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Objective 4: Use a tire balancer to balance tires of a vehicle using proper procedures.

1. Correctly mount wheel to the balancer.
2. Correctly balance a wheel and tire assembly

Objective 5: Locate a leak and identify proper repair procedure.

1. Inspect interior and exterior of the tire.
2. Determine if the tire can be repaired.
3. Repair the tire damage correctly.
4. Verify tire repair.

Objective 6: Interpret tire sidewall markings: size, inflation, and load.

1. Tire type
2. Section width in millimeters
3. Aspect ratio
4. Speed rating
5. Construction type
6. Rim diameter

STANDARD 4

◆ IDENTIFY AND PERFORM BASIC SERVICES ON A VEHICLE.

Objective 1: Locate and identify basic automotive parts.

1. Identify engine parts.
 - Block, crankshaft, camshaft, piston, cylinder head, connecting rod, valve train, timing components
 - Fuel systems: injector, filter, lines, pump, tank.
 - Ignition systems: spark plugs, coil(s).
 - Cooling systems: radiator, pump, thermostat
2. Identify drive train parts.
 - Manual Transmission
 - Automatic Transmission
 - Drivelines
 - Drive Axles
3. Identify brake parts.
 - Master cylinder, lines, caliper, rotor, drum, wheel cylinder, pads, shoes
4. Identify steering and suspension parts.
 - Steering gear: worm gear vs. rack and pinion
 - Tie-rod
 - Shocks / Struts
 - Springs: leaf, coil, torsion bar, air
5. Identify electrical parts.
 - Battery
 - Alternator
 - Starter
 - Circuit protection: fuse, breaker



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- Objective 2: Based on the manufacture's specifications, check and adjust all vehicle fluid levels.
1. Check belt tension and condition.
 2. Check condition of hoses.
 3. Check coolant strength and leaks.
- Objective 3: Change engine oil and filter on a vehicle. Use proper disposal methods for waste oil.
1. Lubricate chassis
 2. Check air filter
- Objective 4: With a voltmeter, check battery voltage with the engine running and with the engine off.
1. Properly jump start a vehicle
- Objective 5: Check shocks or struts.
1. Check for leakage.
 2. Check for proper operation.
- Objective 5: Understand the four stroke cycle.
1. Intake
 2. Compression
 3. Power
 4. Exhaust
- Objective 6: Check brakes.
1. Lining thickness
 2. Fluid leaks
 3. Park brake function
- Objective 7: Check lights.
1. Replace light bulbs as needed.

STANDARD 5

◆ **STUDENTS WILL BE ABLE TO IDENTIFY BASIC EMISSION COMPONENTS.**

- Objective 1: Identify common emission components.
- Objective 2: Run an emission test on a vehicle.

STANDARD 6

◆ **SOLVE BASIC MATHEMATICAL EQUATIONS RELATED TO AUTOMOTIVE.**

- Objective 1: Solve whole number problems with two- and three-digits.
1. Addition
 2. Subtraction
 3. Multiplication
 4. Division



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- Objective 2: Solve fraction problems.
1. Addition
 2. Subtraction
 3. Multiplication
 4. Division
- Objective 3: Solve decimal problems with two- and three-digits.
1. Addition
 2. Subtraction
 3. Multiplication
 4. Division
- Objective 4: Solve conversion problems.
1. Fraction-to-decimal
 2. Decimal-to-fraction
 3. Decimal-to-percent
 4. Percent-to-decimal
- Objective 5: Solve basic ratio-to-proportion problems.
- Objective 6: Solve basic linear-measurement problems
1. Measuring using the Imperial system.
 2. Measuring using the Metric system.

STANDARD 7

◆ IDENTIFY AND PROPERLY PERFORM A VEHICLE INSPECTION.

- Objective 1: Inspect a vehicle's ownership, glass, lights, and accessories.
1. Check for vehicle registration.
 2. Inspect vehicle windshield and other glass for excessive damage, breakage, inadequate movement, and unsafe alterations.
 3. Inspect vehicle headlights and auxiliary lights for correct aiming; inspect headlights, auxiliary lights, tail lights, brake lights, turn signals, and other lights for malfunction, damage, or other unsafe conditions.
 4. Inspect vehicle windshield wipers, windshield washers, windshield defrosters, horn, speedometer, odometer, and automatic transmission/starter interlock for damage or malfunction.
- Objective 2: Inspect a vehicle's brakes, steering and suspension, and tires.
1. Inspect vehicle tires and wheels for excessive wear, damage, mismatched sizes, and improper mounting and illegal studs.
 2. Inspect vehicle steering and suspension assemblies for excessive wear, damage, missing parts, and improper functioning.
 3. Inspect altered vehicles to confirm that they conform to required tolerances for raised or lowered suspension and other changes.
 4. Using a brake plate or visual method, inspect vehicle brake systems for excessive wear, damage, missing parts, improper functioning, and other related safety hazards.



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- Objective 3: Inspect a vehicle's exhaust and fuel systems.
1. Inspect vehicle exhaust systems for excessive wear, damage, malfunction, and illegal configuration.
 2. Inspect vehicle fuel systems for damage, malfunction, or leakage.
- Objective 4: Inspect a vehicle's body.
1. Inspect vehicle body, frame, motor mounts, fenders, bumpers, floor pan, doors, hood, seats, exterior mirrors, interior mirror, and seat belts for excessive damage, illegal configuration, missing parts, and malfunction of mechanical assemblies.
 2. Inspect "Sand" or "Dune" buggies to meet regular passenger car requirements.
 3. Inspect street rods and other modified vehicles to meet minimum equipment and safety requirements for limited use on public highways.

