

Unit Title:

Hand Tools, Equipment & Component Service Practice

Unit Dates: September 22, 2025 – October 10, 2025

State Standards Covered:

- SC DOE Automotive Technology 1–4 Standards (2023–2024)
 - **Shop & Personal Safety:** PPE, hazard communication, machine guarding, lockout/tagout
 - **Tools & Equipment:** hand tools, precision measuring tools, metric/SAE fasteners, safe tool use
 - **Engine / Drivetrain / Suspension / Brake Systems:** belt replacement, ignition coil/tune-ups, disc brakes, axle shafts, steering knuckles, valve covers, intake manifolds, water pumps, oil pans, radiator hoses
 - **Tire Service:** mounting/dismounting tires, wheel balancing
 - **Work Practices:** repair order completion, customer concern/cause/correction documentation
 - **OSHA 10 Safety Standards:** hazard recognition, PPE, machine guarding, lockout/tagout, hazard communication, emergency procedures
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Unit Learning Target

By the end of this unit, students will be able to safely and accurately perform removal, replacement, and maintenance tasks on automotive components (serpentine belts, ignition coils, disc brakes, axle shafts, steering knuckles, valve covers, intake manifolds, water pumps, oil pans, radiator hoses), mount and balance tires, and complete OSHA 10 training, as evaluated through practical labs, repair order documentation, and written quizzes.

Overview

This 3-week unit provides intensive hands-on practice using automotive tools and equipment to remove, replace, and service common vehicle components. Students will work with belts, ignition systems, brakes, drivetrain and suspension parts, engine components, tires, and wheel balancing machines. OSHA 10 training is embedded to ensure students understand safety, hazard communication, and proper shop procedures. Students will learn through guided demonstrations,

bellringer diagnostic prompts, individual and group labs, and integration projects. Activities emphasize real-world application and professional documentation using repair orders.

Skills for the teacher to teach

- Safe handling and proper use of hand tools and precision measuring instruments
 - Component removal and reinstallation procedures (belts, brakes, ignition, engine, drivetrain, suspension)
 - Tire mounting and balancing techniques (rim clamp, center clamp, balancing machine)
 - Diagnosis using bellringer scenarios
 - OSHA 10 safety compliance in a shop environment
 - Documentation and completion through the use of jobsheets
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Task for students to complete

- Practice using service information
 - Remove and replace serpentine belts, ignition coils, perform tune-ups
 - Remove and replace disc brakes (calipers, pads, rotors), axle shafts, steering knuckles
 - Remove and replace valve covers, intake manifolds, water pumps, oil pans, radiator hoses
 - Mount and dismount tires using rim clamp and center clamp machines
 - Balance tires using balancing machines and correct imbalances
 - Complete OSHA 10 training and apply safety protocols in all labs
 - Document all work using jobsheets and inspection checklists
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Assessment students will complete / Product they will produce

- Daily lab performance evaluating accuracy, safety, and procedure
- Bellringer diagnostic prompts evaluating reasoning and troubleshooting
- Written quizzes on tool use, component function, safety, and procedures
- Practical summative exam covering component removal/replacement, tire mounting/balancing
- Completed jobsheets for the lab and integration project
- OSHA 10 certificate upon completion of training modules

Planning

Resources / Materials / Supplies Needed:

- Hand tools: wrenches, sockets, pliers, hammers, screwdrivers, pullers
- Precision measuring tools: micrometers, dial calipers, dial indicators
- Engine and drivetrain components: belts, ignition coils, brake parts, axle shafts, valve covers, intake manifolds, water pumps, oil pans, radiator hoses
- Tire machines: rim clamp and center clamp
- Tire balancing machine and balancing weights
- PPE: safety glasses, gloves, hearing protection, closed-toe shoes
- Repair order forms, workbooks, instructional handouts
- Chromebooks for OSHA 10 training modules and service information

Certification:

- OSHA 10 Completion Certificate (General Industry or Construction track, approved for shop safety)
- Potential future certifications aligned with ASE foundation skills

Monitoring and Reflection

How students will know they are making progress:

- Daily lab rubrics (jobsheets) and instructor feedback
- Successful completion of bellringer diagnostic scenarios
- Accuracy and safety in performing component removal/replacement and tire balancing
- Completion and correctness of documentation
- Completion of OSHA 10 training modules

Student Reflection:

- Students will write short reflections after each lab or diagnostic bellringer describing successes, challenges, and lessons learned
- Group discussions on troubleshooting and safety challenges encountered

Teacher Reflection Notes:

- Adjust pacing if students require more time on complex components (e.g., brakes, steering knuckles)
- Modify lab groupings based on skill levels or shop space
- Evaluate effectiveness of bellringer diagnostic prompts and adjust complexity
- Note any recurring safety issues or tool handling errors for reinforcement