

STRANDS AND STANDARDS

ASE BRAKES



Course Description

This course is part of a sequence that prepares individuals to engage in the servicing and maintenance of all types of automobiles. Instruction includes: training in safety, the diagnosis of malfunctions, and repair of braking systems. This course is based on the Automotive Service Excellence (ASE) task list. Work ethics and productivity are an integral part of the classroom and lab activities of these courses. The most current information can be found at the AST Task List at the following address: <https://www.asealliance.org/natef-accreditation/program-standards>.

Intended Grade Level	11-12
Units of Credit	Minimum 0.5
Core Code	40.09.00.00.022
Concurrent Enrollment Core Code	40.09.00.13.022
Prerequisite	Introduction to Automotive
Skill Certification Test Number	Industry test 955
Test Weight	1.0
License Type	CTE and/or Secondary Education 6-12
Required Endorsement(s)	
Endorsement 1	Automotive Service
Endorsement 2	N/A
Endorsement 3	N/A



STRAND 1

Students will be able to understand, identify, and properly diagnose and repair hydraulic system problems.

Standard 1

Measure and adjust pedal pushrod length.

Standard 2

Check master cylinder for internal and external leaks and proper operation; determine needed repairs.

Standard 3

Remove, bench bleed, and replace master cylinder.

Standard 4

Diagnose poor stopping, pulling, or dragging caused by problems in the hydraulic system; determine needed repairs.

Standard 5

Inspect brake lines and fittings for leaks, dents, kinks, rust, cracks or wear; tighten loose fittings and supports.

Standard 6

Inspect flexible brake hoses for leaks, kinks, cracks, bulging or wear; tighten loose fittings and supports.

Standard 7

Fabricate and install brake lines (double flare or ISO types); replace hoses, fittings, and supports as needed.

Standard 8

Select, handle, store, and install brake fluids to proper level.

Standard 9

Inspect, test, and replace metering (hold-off), proportioning (balance), pressure differential, and combination valves.

Standard 10

Inspect, test, replace, and adjust height sensing (load) proportioning valve.

Standard 11

Inspect, test, and replace components of brake warning light system.

Standard 12

Bleed (manual, pressure, vacuum, or surge) brake system flush as needed.

Performance Skill

Understand, identify, and properly diagnose and repair hydraulic system problems.

- Measure and adjust pedal pushrod length.
- Check master cylinder for internal and external leaks and proper operation; determine needed repairs.
- Remove, bench bleed, and replace master cylinder.
- Diagnose poor stopping, pulling, or dragging caused by problems in the hydraulic system; determine needed repairs.
- Inspect brake lines and fittings for leaks, dents, kinks, rust, cracks or wear; tighten loose fittings and supports.
- Inspect flexible brake hoses for leaks, kinks, cracks, bulging or wear; tighten loose fittings and supports.
- Fabricate and install brake lines (double flare or ISO types); replace hoses, fittings, and supports as needed.
- Select, handle, store, and install brake fluids to proper level.
- Inspect, test, and replace metering (hold-off), proportioning (balance), pressure differential, and combination valves.
- Inspect, test, replace, and adjust height sensing (load) proportioning valve.
- Inspect, test, and replace components of brake warning light system.
- Bleed (manual, pressure, vacuum, or surge) brake system flush as needed.

STRAND 2

Students will be able to understand, identify, and properly diagnose and repair drum brakes.

Standard 1

Diagnose poor stopping, noise, pulling, grabbing, dragging, or pedal pulsation problems; determine needed repairs.

Standard 2

Remove, clean (using proper safety procedures), inspect, and measure brake drums; service or replace as needed.

Standard 3

Mount brake drum on lathe and machine braking surface.

Standard 4

Remove, clean, and inspect brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates; lubricate and reassemble.

Standard 5

Remove and reinstall wheel cylinders.

Standard 6

Adjust brake, shoes, and reinstall brake drums or drum/hub assemblies and wheel bearings.

Standard 7

Reinstall wheel; torque lug nuts.

Performance Skill

Understand, identify, and properly diagnose and repair drum brakes.

- Diagnose poor stopping, noise, pulling, grabbing, dragging, or pedal pulsation problems; determine needed repairs.
- Remove, clean (using proper safety procedures), inspect, and measure brake drums; service or replace as needed.
- Mount brake drum on lathe and machine braking surface.
- Remove, clean, and inspect brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates; lubricate and reassemble.
- Remove and reinstall wheel cylinders.
- Adjust brake, shoes, and reinstall brake drums or drum/hub assemblies and wheel bearings.
- Reinstall wheel; torque lug nuts.

STRAND 3

Students will be able to understand, identify, and properly diagnose and repair disc brakes.

Standard 1

Diagnose poor stopping, noise, pulling, grabbing, dragging, or pedal pulsation problems; determine needed repairs.

Standard 2

Remove caliper assembly from mountings; clean and inspect for leaks and damage to caliper housing.

Standard 3

Clean and inspect caliper mounting and slides for wear and damage.

Standard 4

Remove, clean, and inspect pads and retaining hardware; determine needed service.

Standard 5

Disassemble and clean caliper assembly; inspect parts for wear, rust, scoring, and damage; replace seal, boot, and damaged or worn parts.

Standard 6

Reassemble, lubricate, and reinstall caliper, pads, and related hardware.

Standard 7

Clean and inspect rotor; measure rotor with a dial indicator and a micrometer.

Standard 8

Using the power formula, calculate the amount of power used by a circuit.

Standard 9

Adjust calipers with integrated parking brake system.

Standard 10

Fill master cylinder with recommended fluid and seat pads; inspect caliper for leaks.

Standard 11

Reinstall wheel; torque lug nuts.

Performance Skill

Understand, identify, and properly diagnose and repair disc brakes.

- Diagnose poor stopping, noise, pulling, grabbing, dragging, or pedal pulsation problems; determine needed repairs.
- Remove caliper assembly from mountings; clean and inspect for leaks and damage to caliper housing.
- Clean and inspect caliper mounting and slides for wear and damage.
- Remove, clean, and inspect pads and retaining hardware; determine needed service.
- Disassemble and clean caliper assembly; inspect parts for wear, rust, scoring, and damage; replace seal, boot, and damaged or worn parts.
- Reassemble, lubricate, and reinstall caliper, pads, and related hardware.
- Clean and inspect rotor; measure rotor with a dial indicator and a micrometer.
- Using the power formula, calculate the amount of power used by a circuit.
- Adjust calipers with integrated parking brake system.
- Fill master cylinder with recommended fluid and seat pads; inspect caliper for leaks.
- Reinstall wheel; torque lug nuts.

STRAND 4

Students will be able to understand, identify and properly diagnose and repair power assist units.

Standard 1

Test pedal free travel with and without engine running; check power assist operation.

Standard 2

Check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster.

Standard 3

Inspect the vacuum-type power booster unit for vacuum leaks; inspect the check valve for proper operation; repair or replace parts as needed.

Performance Skill

Understand, identify and properly diagnose and repair power assist units.

- Test pedal free travel with and without engine running; check power assist operation.
- Check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster.
- Inspect the vacuum-type power booster unit for vacuum leaks; inspect the check valve for proper operation; repair or replace parts as needed.

STRAND 5

Students will be able to understand, identify, and properly diagnose and repair miscellaneous brake related areas such as: wheel bearings, parking brakes, electrical, etc.

Standard 1

Diagnose wheel bearing noises, wheel shimmy, and vibration problems; determine needed repairs.

Standard 2

Remove, clean, inspect, repack, and reinstall wheel bearings and replace seals; reinstall hub and adjust wheel bearings.

Standard 3

Check parking brake cables and components for wear, rusting, binding, and corrosion; clean, lubricate, and replace as needed.

Standard 4

Check parking brake operation; adjust as needed.

Standard 5

Check operation of parking brake indicator light system.

Standard 6

Check operation of brake stop light system; adjust and service as needed.

Performance Skill

Understand, identify, and properly diagnose and repair miscellaneous brake related areas such as wheel bearings, parking brakes, electrical, etc.

- Diagnose wheel bearing noises, wheel shimmy, and vibration problems; determine needed repairs.
- Remove, clean, inspect, repack, and reinstall wheel bearings and replace seals; reinstall hub and adjust wheel bearings.
- Check parking brake cables and components for wear, rusting, binding, and corrosion; clean, lubricate, and replace as needed.
- Check parking brake operation; adjust as needed.
- Check operation of parking brake indicator light system.
- Check operation of brake stop light system; adjust and service as needed.

STRAND 6

Students will be able to understand, identify, and properly diagnose anti-lock brake systems.

Standard 1

Inspect, test, and service the anti-lock brake system's (ABS) hydraulic, electrical, and mechanical components.

Standard 2

Diagnose poor stopping, wheel lockup, pedal feel, pulsation, and noise problems caused by the anti-lock brake system (ABS); determine needed repairs.

Standard 3

Observe the anti-lock brake system's (ABS) warning light(s) at startup; determine if further diagnose is needed.

Standard 4

Diagnose the anti-lock brake system's (ABS) electronic control(s) and components using self-diagnose and/or recommended test equipment; determine needed repairs.

Standard 5

Depressurize integral (high pressure) components of the anti-lock brake system (ABS) following manufacturer's recommended safety procedures.

Standard 6

Fill the anti-lock brake system's (ABS) master cylinder with recommended fluid following manufacturer's procedures; inspect system for leaks.

Standard 7

Bleed the anti-lock brake system's (ABS) front and rear hydraulic circuits following manufacturer's procedures.

Standard 8

Perform a fluid pressure (hydraulic boost) diagnose on the integral (high pressure) anti-lock system (ABS); determine needed repairs.

Standard 9

Remove and install the anti-lock brake system's (ABS) electrical/electronic/hydraulic components following manufacturer's procedures and specifications.

Standard 10

Service, test, and adjust the anti-lock brake system's (ABS) speed sensors, following manufacturer's recommended procedures.

Performance Skill

Understand, identify, and properly diagnose anti-lock brake systems.

- Inspect, test, and service the anti-lock brake system's (ABS) hydraulic, electrical, and mechanical components.
- Diagnose poor stopping, wheel lockup, pedal feel, pulsation, and noise problems caused by the anti-lock brake system (ABS); determine needed repairs.
- Observe the anti-lock brake system's (ABS) warning light(s) at startup; determine if further diagnose is needed.
- Diagnose the anti-lock brake system's (ABS) electronic control(s) and components using self-diagnose and/or recommended test equipment; determine needed repairs.
- Depressurize integral (high pressure) components of the anti-lock brake system (ABS) following manufacturer's recommended safety procedures.
- Fill the anti-lock brake system's (ABS) master cylinder with recommended fluid following manufacturer's procedures; inspect system for leaks.
- Bleed the anti-lock brake system's (ABS) front and rear hydraulic circuits following manufacturer's procedures.
- Perform a fluid pressure (hydraulic boost) diagnose on the integral (high pressure) anti-lock system (ABS); determine needed repairs.
- Remove and install the anti-lock brake system's (ABS) electrical/electronic/hydraulic components following manufacturer's procedures and specifications.
- Service, test, and adjust the anti-lock brake system's (ABS) speed sensors, following manufacturer's recommended procedures.

STRAND 7

Students will understand the importance of career readiness skills as it relates to the workplace and outlined in the SkillsUSA Framework – Level 2.

Standard 1

Understand and demonstrate reliability.

- Determine individual time management skills.
- Explore what's ethical in the workplace or school.
- Demonstrate awareness of government.
- Demonstrate awareness of professional organizations and trade unions.

Standard 2

Understand and demonstrate responsiveness.

- Define the customer.
- Recognize benefits of doing a community service project.
- Demonstrate social etiquette.
- Identify customer expectations.

Standard 3

Understand resiliency.

- Discover self-motivation techniques and establish short-term goals.
- Select characters of a positive image.
- Identify a mentor.

Standard 4

Understand and demonstrate workplace habits.

- Participate in a shadowing activity.
- Explore workplace ethics: codes of conduct.
- Recognize safety issues.
- Perform a skill demonstration.
- Exercise your right to know.

Standard 5

Understand and develop initiative.

- Develop personal financial skills.
- Develop a business plan.
- Investigate entrepreneurship opportunities.

Standard 6

Understand and demonstrate continuous improvement.

- Conduct a worker interview.
- Demonstrate evaluation skills.
- Examine ethics and values in the workplace.
- Develop a working relationship with a mentor.
- Construct a job search network.

STRAND 8

Students will understand the importance of career readiness skills as it relates to the workplace and outlined in the SkillsUSA Framework – Level 3.

Standard 1

Understand and develop collaboration skills.

- Develop a working relationship with a mentor.
- Apply supervisory skills.
- Manage a project and evaluate others.

Standard 2

Understand and demonstrate change management skills.

- Evaluate your career and training goals.
- Identify and apply conflict resolution skills.
- Illustrate an organizational structure.
- Plan and implement a leadership project.

Standard 3

Understand how customer service applies to the workplace.

- Serve as a volunteer in the community.
- Examine workplace ethics: the role of values in making decisions.
- Understand the cost of customer service.
- Develop customer service skills.
- Maximize customer service skills.

Standard 4

Understand and demonstrate career readiness.

- Market your career choice.
- Research resume writing.
- Demonstrate interviewing skills.
- Predict employment trends.
- Re-evaluate career goals and establish long-term goals.
- Construct a job search network.
- Evaluate professional competencies.
- Analyze your entry-level job skills.
- Design and present a lesson plan on an aspect of your career choice.
- Write an article for a professional journal in your career area.
- Refine your employment portfolio.