

Brakes

Grades 9-12

Refer to NATEF (National Automotive Technicians Education Foundation) standards, 2013.

BRAKES

For every task in Brakes, the following safety requirement must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

V. BRAKES

A. General

- 1. Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins. P-1
- 2. Describe procedure for performing a road test to check brake system operation, including an anti-lock brake system (ABS). P-1
- 3. Install wheel and torque lug nuts P-1

V. BRAKES

B. Hydraulic System

- 1. Measure brake pedal height, travel, and free play (as applicable); determine necessary action. P-1
- 2. Check master cylinder for external leaks and proper operation. P-1
- 3. Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging, wear, loose fittings and supports; determine necessary action. P-1
- 4. Select, handle, store, and fill brake fluids to proper level. P-1
- 5. Identify components of brake warning light system. P-3
- 6. Bleed and/or flush brake system. P-1
- 7. Test brake fluid for contamination. P-1

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V. BRAKES

C. Drum Brakes

1. Remove, clean, inspect, and measure brake drum diameter, determine necessary action. P-1
2. Refinish brake drum and measure final drum diameter; compare with specifications P-1
3. Remove, clean and inspect brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates; lubricate and reassemble. P-1
4. Inspect wheel cylinders for leaks and proper operation; remove and replace as needed. P-2
5. Pre-adjust brake shoes and parking brake; install brake drums or drum/hub assemblies and wheel bearings; make final checks and adjustments. P-2

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V. BRAKES**D. Disc Brakes**

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| 1. Remove and clean caliper assembly; inspect for leaks and damage/wear to caliper housing; determine necessary action | P-1 |
| 2. Clean and inspect caliper mounting and slides/pins for proper operation, wear, and damage; determine necessary action. | P-1 |
| 3. Remove, inspect, and replace pads and retaining hardware; determine necessary action. | P-1 |
| 4. Lubricate and reinstall caliper, pads, and related hardware; seat pads and inspect for leaks. | P-1 |
| 5. Clean and inspect rotor, measure rotor thickness, thickness variation, and lateral runout; determine necessary action. | P-1 |
| 6. Remove and reinstall rotor. | P-1 |
| 7. Refinish rotor on vehicle; measure final rotor thickness and compare with specifications. | P-1 |
| 8. Refinish rotor off vehicle; measure final rotor thickness and compare with specifications. | P-1 |
| 9. Retract and re-adjust caliper piston on an integral parking brake system. | P-3 |
| 10. Check brake pad wear indicator; determine necessary action. | P-2 |
| 11. Describe importance of operating vehicle to burnish/break-in replacement brake pads according to manufacturer's recommendations. | P-1 |

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V. BRAKES

E. Power-Assist Units

- 1. Check brake pedal travel with, and without, engine running to verify proper power booster operation. P-2
- 2. Check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster. P-1

V. BRAKES

F. Accessories

- 1. Remove, clean, inspect, repack, and install wheel bearings; replace seals; install hub and adjust bearings P-1
- 2. Check parking brake cables and components for wear, binding, and corrosion; clean, lubricate, adjust or replace as needed. P-2
- 3. Check parking brake operation and parking brake indicator light system operation; determine necessary action. P-1
- 4. Check operation of brake stop light system. P-1
- 5. Replace wheel bearing and race. P-2
- 6. Inspect and replace wheel studs. P-1

V. BRAKES

G. Electronic Brakes, and Traction and Stability Control Systems

- 1. Identify traction control/vehicle stability control system components. P-3
- 2. Describe the operation of a regenerative braking system. P-3

EE Total Tasks	
P-1	26
P-2	6
P-3	4
	36