

Course Name

Brakes 1

Course Information

Developers: Automotive Technology State Curriculum Committee

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Development Date: 3/10/2014

KBOR Facilitators: Shirley Antes/ April Henry

Credit Hours: 3

Description:

This course is a thorough and detailed study of brake system theory and functional operation and principles of hydraulic systems as it applies to braking system operation. Practical applications of all phases of brake work including complete system service of disc and drum brake systems, parking brake systems, power assist devices and machining of brake disc and drum.

Competencies:

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

B. Hydraulic Systems

1. Measure brake pedal heights, 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

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 break 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

D. Disc Brakes

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

E. Power-Assist Unit

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

F. Miscellaneous

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

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