

Learning Standards for the Automotive MLR Program of Study

Mt. Hood CTE Consortium

(The following list was created/edited by teachers at the secondary and post-secondary level in conjunction with local industry partners. These learning standards represent the common core that all teachers in the region will be responsible for teaching during the entire high school program of study.)

A ENGINE REPAIR

General

- A 01 Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins
- A 02 Verify operation of the instrument panel engine warning indicators
- A 03 Inspect vehicle for fuel, oil, coolant, and other leaks; determine necessary action
- A 04 Install engine covers using gaskets, seals, and sealers as required
- A 05 Remove and replace timing belt; verify correct camshaft timing
- A 06 Perform common fastener and thread repair, to include: remove broken bolt, restore internal and external threads, and repair internal threads with thread insert
- A 07 Check and adjust fluid level per Manufacturer's specifications
- A 08 Perform engine oil and filter change

B SUSPENSION AND STEERING

Related Suspension and Steering Service

- B 01 Inspect rack and pinion steering gear inner tie rod ends (sockets) and bellows boots
- B 02 Determine proper power steering fluid type; inspect fluid level and condition
- B 03 Inspect for power steering fluid leakage; determine necessary action
- B 04 Remove, inspect, replace, and adjust power steering pump drive belt
- B 05 Inspect pitman arm, relay (centerlink/intermediate) rod, idler arm and mountings, and steering linkage damper
- B 06 Inspect tie rod ends (sockets), tie rod sleeves, and clamps
- B 07 Inspect upper and lower control arms, bushings, and shafts
- B 08 Inspect and replace rebound and jounce bumpers
- B 09 Inspect track bar, strut rods/radius arms, and related mounts and bushings
- B 10 Inspect upper and lower ball joints(with or without wear indicators)
- B 11 Inspect suspension system coil springs and spring insulators (silencers)
- B 12 Inspect suspension system torsion bars and mounts
- B 13 Inspect strut cartridge or assembly
- B 14 Inspect front strut bearing and mount
- B 15 Inspect rear suspension system lateral links/arms (track bars), control (trailing) arms
- B 16 Inspect rear suspension system leaf spring(s), spring insulators (silencers), shackles, brackets, bushings, center pins/bolts, and mounts
- B 17 Inspect, remove, and replace shock absorbers; inspect mounts and bushings

Wheel Alignment

- B 18 Perform pre-alignment inspection and measure vehicle ride height; determine necessary action

Wheels and Tires

- B 19 Inspect tire condition; identify tire wear patterns; check for correct size and application (load and speed ratings) and adjust air pressure; determine necessary action
- B 20 Rotate tires according to manufacturer's recommendations
- B 21 Dismount, inspect, and remount tire on wheel; balance wheel and tire assembly (static and dynamic)
- B 22 Repair tire using internal patch

C BRAKES

Hydraulic System

- C 01 Measure brake pedal height, travel, and free play (as applicable); determine necessary action
- C 02 Check master cylinder for external leaks and proper operation
- C 03 Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging, wear, loose fittings and supports; determine necessary action
- C 04 Select, handle, store, and fill brake fluids to proper level
- C 05 Bleed and/or flush brake system

Drum Brakes

- C 06 Remove, clean, inspect, and measure brake drum diameter; determine necessary action
- C 07 Refinish brake drum and measure final drum diameter; compare with specifications
- C 08 Remove, clean, and inspect brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates; lubricate and reassemble
- C 09 Install wheel and torque lug nuts

Disk Brakes

- C 10 Remove and clean caliper assembly; inspect for leaks and damage/wear to caliper housing; determine necessary action
- C 11 Clean and inspect caliper mounting and slides/pins for proper operation, wear, and damage; determine necessary action
- C 12 Remove, inspect, and replace pads and retaining hardware; determine necessary action
- C 13 Lubricate and reinstall caliper, pads, and related hardware; seat pads and inspect for leaks
- C 14 Clean and inspect rotor, measure rotor thickness, thickness variation, and lateral run out; determine necessary action
- C 15 Remove and reinstall rotor
- C 16 Refinish rotor off vehicle; measure final rotor thickness and compare with specifications

- C 17 Describe importance of operating vehicle to burnish/break-in replacement brake pads according to manufacturer's recommendations

Power-Assist Units

- C 18 Check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster
- C 19 Remove, clean, inspect, repack, and install wheel bearings; replace seals; install hub and adjust bearings
- C 20 Check parking brake operation and parking brake indicator light system operation; determine necessary action
- C 21 Check operation of brake stop light system

D MISCELLANEOUS (Wheel Bearings, Parking Brakes, Electrical, Etc.)

General

- D 01 Demonstrate knowledge of electrical/electronic series, parallel, and series-parallel circuits using principles of electricity (Ohm's Law)
- D 02 Use wiring diagrams to trace electrical/electronic circuits
- D 03 Demonstrate proper use of a digital multimeter (DMM) when measuring source voltage, voltage drop (including grounds), current flow, and resistance
- D 04 Measure key-off battery drain (parasitic draw)
- D 05 Inspect and test fusible links, circuit breakers, and fuses; determine necessary action
- D 06 Perform solder repair of electrical wiring
- D 07 Replace electrical connectors and terminal ends

Battery Service

- D 08 Perform battery state-of-charge test; determine necessary action
- D 09 Confirm proper battery capacity for vehicle application; perform battery capacity test; determine necessary action
- D 10 Maintain or restore electronic memory functions