WARREN COUNTY SCHOOL DISTRICT
PLANNED INSTRUCTION

COURSE DESCRIPTION

Course Title: Automotive Technology
Course Number: 00902 AM 00952 PM

Course Prerequisites: Student must complete 9th grade before being accepted into the Automotive Technology Program.

Special Requirements: Mechanical talents, problem solving, and the ability to use “head and hands together” are very important. Applied math, science, computer, and communication skills are also vital to this career field.

Course Description:
47.0604
AUTOMOBILE/AUTOMOTIVE MECHANICS TECHNOLOGY/TECHNICIAN
Pennsylvania CIP
An instructional program that prepares individuals to apply technical knowledge and skills to engage in the servicing and maintenance of all types of automobiles and light trucks. This program includes instruction in the diagnosis and testing, including computer analysis, of malfunctions in and repair of engines, fuel, electrical, cooling and brake systems and drive train and suspensions. Instruction is also given in the adjustment and repair of individual components and systems such as cooling systems, drivetrains, fuel system components and air conditioning, and includes the use of technical repair information and the state inspection procedures.

Suggested Grade Level: Grades 10-12
Length of Course: _____ One Semester _____ Two Semesters _____ Other
Three periods per day (120 Min.) – Five Days per week – Three years

Units of Credit: 3 elective credits per year up to 9 credits

PDE Certification and Staffing Policies and Guidelines (CSPG) Required Teacher Certification(s)
Vocational II—Automotive Mechanic

Certification verified by WCSD Human Resources Department:
   X Yes  No

Board Approved Textbooks, Software, Materials:
Title: CDX Online eTextbook
Publisher: CDX Global
ISBN #: 9780763791117
Course Standards

PA Academic Standards:

Career Education and Work:

13.1.11D Justify the selection of a career.  
(101-109)

13.2.11B Analyze and evaluate complex technical tasks using sophisticated processes.  
(500-551, 601-652, 701-754, 801-853)

13.2.11D Identify sources of health, safety and regulatory practices and their effect on the work environment.  
(101-109, 500-551, 601-652, 701-754, 801-853)

13.2.11F Analyze Performance-based assessments components.  
(500-551, 601-652, 701-754, 801-853)

13.2.11G Analyze the need for manipulative/motor skills.  
(100-109, 201-209, 601-652, 701-754, 801-853)

13.3.11A Analyze work habits needed to advance within a career.  
(100-109, 201-209)

Science and Technology:

3.1.10A Discriminate among the concepts of systems, subsystems, feedback and control in solving technological problems.  
(101-109, 210-209, 500-551, 701-754, 801-853)

3.1.10E Describe patterns of change in nature, physical and man made systems.  
(500-551, 601-651, 701-754, 801-853)

3.7.10A Identify and safely use a variety of tools, basic machines, materials and techniques to solve problems and answer questions.  
(500-551, 601-651, 701-754, 801-853)

3.7.10B Apply appropriate instruments and apparatus to examine a variety of objects and processes.  
(500-551, 601-651, 701-754, 801-853)

3.7.10D Utilize computer software to solve specific problems.  
(500-551, 601-651, 701-754, 801-853)

3.7.12A Apply advanced tools, materials and techniques to answer complex questions.
3.7.12B Evaluate appropriate instruments and apparatus to accurately measure materials and processes. 

(Math: 
2.3.11A Select and use appropriate units and tools to measure to the degree of accuracy required in particular measurement situations. 

(500-551,501-551,601-651,701-754,801-853) 

2.3.11C Demonstrate the ability to produce measures with specified levels of precision. 

(500-551,501-561,601-651,701-754,801 859) 

2.5.11C Present mathematical procedures and results clearly, systematically, succinctly and correctly. 

(201-210,500-551,601-651,701-754,801 853) 

Reading, Writing, Speaking, and Listening: 

1.1.11A Locate various texts, media and traditional resources for assigned and independent projects before reading. 

(201-210,500-551,601-651,701-754,801 853) 

1.2.11A Read and understand essential content of informational texts and documents in all academic areas. 

(201-210,500-551,601-651,701-754,801 853) 

1.4.1D Maintain a written record of activities, course work, experience, honors and interests. 

(100-109,500-551,601-651,701-754,801 853) 

1.4.1E Write a personal resume. 

(100-109) 

1.6.11A Listen to others. 

(101-109,201-210,500-551,601-651,701-754,801 853) 

WCSD Academic Standards: 
Aligned with PA Standards 

Industry or Other Standards: 

1. Automotive Technology NOCTI Written Exam 
2. Automotive Technology NOCTI Performance Exam 
3. AYES Certificate Certification of a candidate’s automotive technology skills based on an internship and exit exam. 

http://www.ayes.org/ 

4. AAA Ford Trouble Shooting Written Exam http://www.autoskills.com 
5. AAA Ford Trouble Shooting Performance Exam http://www.autoskills.com 
6. Section 609 Certification for Refrigerant Recycling and Recovery Section 609 of the Clean Air Act requires that all technicians who open the refrigeration circuit in automotive air conditioning systems be certified. 

http://www.macsw.org/AM/Template.cfm?Section=Section609 


http://www.natef.org/about/aboutasenatef.cfm 

8. Certified Emissions Inspector Certified Certified Emissions Inspector Training;
PennDOT-approved certification course.
http://www.drivecleanpa.state.pa.us/drivecleanpa/info_service.htm
9. **Certified Safety Inspector** Candidates must complete a PennDOT-approved Safety course and complete the required exams.
http://www.dot4.state.pa.us/inspections/safety_stationmech_faq.shtml
10. **S/P2 Safety & Pollution Prevention** http://www.ccar-traininglink.org/index.ph

**SPECIAL EDUCATION AND GIFTED REQUIREMENTS**

The teacher shall make appropriate modifications to instruction and assessment based on a student’s Individual Education Plan (IEP) or Gifted Individual Education Plan (GIEP).
All of the following standards are meant by the use of CDX Global online and Alldata information system online.

All assignments and curriculum are online for student access at home or at school.

Automobile/Automotive Mechanics Technology/Technician
CIP 47.0604

PA Academic Standards/Eligible Content Alignment Task List

<table>
<thead>
<tr>
<th>Code</th>
<th>Task</th>
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<tbody>
<tr>
<td>100</td>
<td>ORIENTATION</td>
</tr>
<tr>
<td>101</td>
<td>Explain and follow all lab rules</td>
</tr>
<tr>
<td>102</td>
<td>Participate in basic shop management</td>
</tr>
<tr>
<td>104</td>
<td>Explain career opportunities</td>
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<tr>
<td>105</td>
<td>Demonstrate auto shop safety and hygiene</td>
</tr>
<tr>
<td>107</td>
<td>Demonstrate proper telephone courtesy</td>
</tr>
<tr>
<td>108</td>
<td>Identify vehicle by: sight, V.I.N. and/or ID tag</td>
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<tr>
<td>200</td>
<td>SAFETY</td>
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<tr>
<td>201</td>
<td>Identify and follow all safety rules</td>
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<tr>
<td>202</td>
<td>Demonstrate the ability to secure vehicles on jack stands and hydraulic lifts</td>
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<tr>
<td>203</td>
<td>Demonstrate the ability to safely set-up/shut-down oxygen acetylene welding equipment</td>
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<tr>
<td>204</td>
<td>Identify chemical safety, Right-To-Know Laws and Materials Safety Data Sheets (MSDS)</td>
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<tr>
<td>205</td>
<td>Demonstrate the safe use of hand tools</td>
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<td>206</td>
<td>Demonstrate the safe use of power tools</td>
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<td>207</td>
<td>Demonstrate the safe use of protective clothing and equipment</td>
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<td>208</td>
<td>Demonstrate the safe use of fire protection equipment</td>
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<tr>
<td>209</td>
<td>Demonstrate the safe use of shop equipment</td>
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<tr>
<td>210</td>
<td>Explain EPA and OSHA regulations</td>
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<tr>
<td>300</td>
<td>TOOLS/FASTENERS</td>
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<tr>
<td>301</td>
<td>Identify and use fasteners and bolts</td>
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<td>302</td>
<td>Demonstrate the ability to correctly drill and use re-threading tools</td>
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<tr>
<td>303</td>
<td>Demonstrate the ability to correctly read and interpret automotive measuring tools</td>
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<tr>
<td>400</td>
<td>CERTIFICATIONS</td>
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<tr>
<td>401</td>
<td>Obtain PA Safety Inspection Certification</td>
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<tr>
<td>402</td>
<td>Obtain EPA 609 Refrigerant Recovery, Recycling Certification</td>
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<tr>
<td>500</td>
<td>SUSPENSION AND STEERING</td>
</tr>
<tr>
<td>501</td>
<td>Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction</td>
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<tr>
<td>502</td>
<td>Identify and interpret suspension and steering system concerns; determine necessary action</td>
</tr>
<tr>
<td>503</td>
<td>Research applicable vehicle and service information, such as suspension and steering system operation, vehicle service history, service precautions, and technical service bulletins</td>
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<tr>
<td>504</td>
<td>Locate and interpret vehicle and major component identification numbers</td>
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<tr>
<td>505</td>
<td>Disable and enable supplemental restraint system (SRS)</td>
</tr>
<tr>
<td>506</td>
<td>Remove and replace steering wheel; center/time supplemental restraint system (SRS) coil (clock spring)</td>
</tr>
<tr>
<td>507</td>
<td>Inspect steering shaft universal-joint(s), flexible coupling(s), collapsible column, lock cylinder mechanism, and steering wheel; perform necessary action</td>
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<tr>
<td>508</td>
<td>Adjust non-rack and pinion worm bearing preload and sector lash</td>
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<tr>
<td>509</td>
<td>Remove and replace rack and pinion steering gear; inspect mounting bushings and brackets</td>
</tr>
<tr>
<td>510</td>
<td>Inspect and replace rack and pinion steering gear inner tie rod ends (sockets) and bellows boots</td>
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<tr>
<td>511</td>
<td>Determine proper power steering fluid type; inspect fluid level and condition</td>
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<tr>
<td>512</td>
<td>Flush, fill, and bleed power steering system</td>
</tr>
<tr>
<td>513</td>
<td>Diagnose power steering fluid leakage; determine necessary action</td>
</tr>
<tr>
<td>514</td>
<td>Remove, inspect, replace, and adjust power steering pump belt</td>
</tr>
<tr>
<td>515</td>
<td>Remove and reinstall power steering pump</td>
</tr>
<tr>
<td>516</td>
<td>Remove and reinstall press fit power steering pump pulley; check pulley and belt alignment</td>
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<tr>
<td>517</td>
<td>Inspect and replace power steering hoses and fittings</td>
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<tr>
<td>518</td>
<td>Inspect and replace pitman arm, relay (centerlink/intermediate) rod, idler arm and mountings, and steering linkage damper</td>
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<tr>
<td>519</td>
<td>Inspect, replace, and adjust tie rod ends (sockets), tie rod sleeves, and clamps</td>
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<tr>
<td>520</td>
<td>Inspect and test electric power assist steering</td>
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</table>
Diagnose short and long arm suspension system noises, body sway, and uneven ride height concerns; determine necessary action.

Diagnose strut suspension system noises, body sway, and uneven ride height concerns; determine necessary action.

Remove, inspect, and install upper and lower control arms, bushings, shafts, and rebound bumpers.

Remove, inspect and install strut rods and bushings.

Remove, inspect, and install upper and/or lower ball joints.

Remove, inspect, and install steering knuckle assemblies.

Remove, inspect, and install long arm suspension system coil springs and spring insulators.

Remove, inspect, install, and adjust suspension system torsion bars; inspect mounts.

Remove, inspect, and install stabilizer bar bushings, brackets, and links.

Remove, inspect, and install strut cartridge or assembly, strut coil spring, insulators (silencers), and upper.

Inspect, remove, and replace shock absorbers.

Remove, inspect, and service or replace front and rear wheel bearings.

Describe the function of the idle speed compensation switch.

Lubricate suspension and steering systems.

Diagnose vehicle wander, drift, pull, hard steering, bump steer, memory steer, torque steer, and steering return concerns; determine necessary action.

Perform pre-alignment inspection and measure vehicle ride height; perform necessary action.

Prepare vehicle for wheel alignment on the alignment machine; perform four wheel alignment by checking and adjusting front and rear wheel caster, camber; and toe as required; center steering wheel.

Check SAI (steering axis inclination) and included angle; determine necessary action.

Check rear wheel thrust angle; determine necessary action.

Check for front wheel setback; determine necessary action.

Check front and/or rear cradle (subframe) alignment; determine necessary action.

Inspect tire condition; identify tire wear patterns; check and adjust air pressure; determine necessary action.

Diagnose wheel/tire vibration, shimmy, and noise; determine necessary action.

Rotate tires according to manufacturers recommendations.

Measure wheel, tire, axle flange, and hub runout; determine necessary action.

Diagnose tire pull problems; determine necessary action.

Dismount, inspect, and remount tire on wheel; Balance wheel and tire assembly (static and dynamic).

Dismount, inspect, and remount tire on wheel equipped with tire pressure monitoring system sensor.

Reinstall wheel, torque lug nuts.

Inspect tire and wheel assembly for air loss; perform necessary action.

Repair tire using internal patch.

Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.

Identify and interpret brake system concern; determine necessary action.

Research applicable vehicle and service information, such as brake system operation, vehicle service history, service precautions, and technical service bulletins.

Locate and interpret vehicle and major component identification numbers.

Diagnose pressure concerns in the brake system using hydraulic principles (Pascals Law).

Measure brake pedal height, travel, and free play (as applicable); determine necessary action.

Check master cylinder for internal/external leaks and proper operation; determine necessary action.

Remove, bench bleed, and reinstall master cylinder.

Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging or wear; tighten loose fittings and supports; determine necessary action.

Replace brake lines, hoses, fittings, and supports.

Fabricate brake lines using proper material and flaring procedures (double flare and ISO types).

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

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

Bleed and/or flush brake system.

Test brake fluid for contamination.

Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging or pedal pulsation concerns; determine necessary action.

Remove, clean, inspect, and measure brake drums; determine necessary action.

Refinish brake drum; measure final drum diameter.

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

Inspect and install wheel cylinders.

Pre-adjust brake shoes and parking brake; install brake drums or drum/hub assemblies and wheel bearings.

Install wheel, torque lug nuts, and make final checks and adjustments.

Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging or pulsation concerns; determine necessary action.

Remove caliper assembly; inspect for leaks and damage to caliper housing; determine necessary action.
Clean and inspect caliper mounting and slides/pins for operation, wear, and damage; determine necessary action

Remove, inspect and replace pads and retaining hardware; determine necessary action

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; seat pads, and inspect for leaks

Clean, inspect, and measure rotor thickness, lateral runout, and thickness variation; determine necessary action

Remove and reinstall rotor

Refinish rotor on vehicle; measure final rotor thickness

Refinish rotor off vehicle; measure final rotor thickness

Install wheel, torque lug nuts, and make final checks and adjustments

Check brake pad wear indicator system operation; determine necessary action

Test pedal free travel; check power assist operation

Check vacuum supply to vacuum-type power booster

Inspect the vacuum-type power booster unit for leaks; inspect the check valve for proper operation; determine necessary action

Diagnose wheel bearing noises, wheel shimmy, and vibration concerns; determine necessary action

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

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

Check parking brake and indicator light system operation; determine necessary action

Check operation of brake stop light system; determine necessary action

Replace wheel bearing and race

Inspect and replace wheel studs

Remove and reinstall sealed wheel bearing assembly

Identify and inspect electronic brake control system components; determine necessary action

Diagnose electronic brake control system electronic control(s) and components by retrieving diagnostic trouble codes, and/or using recommended test equipment; determine necessary action

Depressurize high-pressure components of the electronic brake control system

Bleed the electronic brake control system hydraulic circuits

Remove and install electronic brake control system electrical/electronic and hydraulic components

Test, diagnose, and service electronic brake control system speed sensors (digital and analog), toothed ring (tone wheel), and circuits using a graphing multimeter (GMM)/digital storage oscilloscope (DSO) (includes output signal, resistance, shorts to ground)

Identify traction control/vehicle stability control system components

Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction

Identify and interpret electrical/electronic system concern; determine necessary action

Research applicable vehicle and service information, such as electrical/electronic system operation, vehicle service history, service precautions, and technical service bulletins

Locate and interpret vehicle and major component identification numbers

Diagnose electrical/electronic integrity of series, parallel and series-parallel circuits using principles of electricity (Ohms Law)

Use wiring diagrams during diagnosis of electrical circuit problems

Demonstrate the proper use of a digital multimeter (DMM) during diagnosis of electrical circuit problems, including: source voltage, voltage drop, current flow, and resistance

Check electrical circuits with a test light; determine necessary action

Check electrical circuits using fused jumper wires; determine necessary action

Locate shorts, grounds, opens, and resistance problems in electrical/electronic circuits; determine necessary action

Measure and diagnose the cause(s) of excessive parasitic draw; determine necessary action

Inspect and test fusible links, circuit breakers, and fuses; determine necessary action

Inspect and test switches, connectors, relays, solenoid solid state devices, and wires of electrical/electronic circuits; perform necessary action

Remove and replace terminal end from connector; replace connectors and terminal ends

Repair wiring harness (including CAN/BUS systems).

Perform solder repair of electrical wiring

Identify location of hybrid vehicle high voltage circuit disconnect (service plug) location and safety procedures

Perform battery state-of-charge test; determine necessary action

Perform battery capacity test; confirm proper battery capacity for vehicle application; determine necessary action

Maintain or restore electronic memory functions
721 Inspect, clean, fill, and/or replace battery, battery cables, connectors, clamps, and hold-downs
722 Perform battery charge
723 Start a vehicle using jumper cables or an auxiliary power supply
724 Identify high voltage circuits of electric or hybrid electric vehicle and related safety precautions
725 Identify electronic modules, security systems, radios, and other accessories that require reinitialization or code entry following battery disconnect
726 Identify hybrid vehicle auxiliary (12v) battery service, repair and test procedures
727 Perform starter current draw tests; determine necessary action
728 Perform starter circuit voltage drop tests; determine necessary action
729 Inspect and test starter relays and solenoids; determine necessary action
730 Remove and install starter in a vehicle
731 Inspect and test switches, connectors, and wires of starter control circuits; perform necessary action
732 Differentiate between electrical and engine mechanical problems that cause a slow-crank or no-crank condition
733 Perform charging system output test; determine necessary action
734 Diagnose charging system for the cause of undercharge, no-charge, and overcharge conditions
735 Inspect, adjust, or replace generator (alternator) drive belts, pulleys, and tensioners; check pulley and belt alignment
736 Remove, inspect, and install generator (alternator)
737 Perform charging circuit voltage drop tests; determine necessary action
738 Diagnose the cause of brighter than normal, intermittent, dim, or no light operation; determine necessary action
739 Inspect, replace, and aim headlights and bulbs
740 Inspect and diagnose incorrect turn signal or hazard light operation; perform necessary action
741 Identify system voltage and safety precautions associated with high intensity discharge headlights
742 Inspect and test gauges and gauge sending units for cause of abnormal gauge readings; determine necessary action
743 Inspect and test connectors, wires, and printed circuit boards of gauge circuits; determine necessary action
744 Diagnose the cause of incorrect operation of warning devices and other driver information systems; determine necessary action
745 Inspect and test sensors, connectors, and wires of electronic (digital) instrument circuits; determine necessary action
746 Diagnose incorrect horn operation; perform necessary action
747 Diagnose incorrect wiper operation; diagnose wiper speed control and park problems; perform necessary action
748 Diagnose incorrect washer operation; perform necessary action
749 Diagnose incorrect operation of motor-driven accessory circuits; determine necessary action
750 Diagnose incorrect electric lock operation (including remote keyless entry); determine necessary action
751 Diagnose supplemental restraint system (SRS) concerns; determine necessary action
752 Disarm and enable the airbag system for vehicle service
753 Remove and reinstall door panel
754 Describe the operation of keyless entry/remote-start systems

800 ENGINE PERFORMANCE
801 Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction
802 Identify and interpret engine performance concern; determine necessary action
803 Research applicable vehicle and service information, such as engine management system operation, vehicle service history, service precautions, and technical service bulletins
804 Locate and interpret vehicle and major component identification numbers
805 Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action
806 Diagnose abnormal engine noise or vibration concerns; determine necessary action
807 Diagnose abnormal exhaust color, odor, and sound; determine necessary action
808 Perform engine absolute (vacuum/boost) manifold pressure tests; determine necessary action
809 Perform engine power balance test; determine necessary action
810 Perform cylinder cranking and running compression tests; determine necessary action
811 Perform cylinder leakage test; determine necessary action
812 Diagnose engine mechanical, electrical, electronic, fuel, and ignition concerns; determine necessary action
813 Verify engine operating temperature; determine necessary action
814 Perform cooling system pressure tests; check coolant condition; inspect and test radiator, pressure cap, coolant recovery tank, and hoses; perform necessary action
815 Verify correct camshaft timing
816 Retrieve and record diagnostic trouble codes, OBD monitor status, and freeze frame data; clear codes when applicable
817 Diagnose the causes of emissions or driveability concerns with stored or active diagnostic trouble codes; obtain, graph, and interpret scan tool data
Diagnose emissions or driveability concerns without stored diagnostic trouble codes; determine necessary action
Inspect and test computerized engine control system sensors, powertrain/engine control module (PCM/ECM), actuators, and circuits using a graphing multimeter (GMM)/digital storage oscilloscope (DSO); perform necessary action
Access and use service information to perform step-by-step diagnosis
Perform active tests of actuators using a scan tool; determine necessary action
Describe the importance of running all OBDII monitors for repair verification
Diagnose ignition system related problems such as no-starting, hard starting, engine misfire, poor driveability, spark knock, power loss, poor mileage, and emissions concerns; determine necessary action
Inspect and test ignition primary and secondary circuit wiring and solid state components; test ignition coil(s); perform necessary action
Inspect and test crankshaft and camshaft position sensor(s); perform necessary action
Inspect, test, and/or replace ignition control module, powertrain/engine control module; reprogram as necessary
Diagnose hot or cold no-starting, hard starting, poor driveability, incorrect idle speed, poor idle, flooding, hesitation, surging, engine misfire, power loss, stalling, poor mileage, dieseling, and emissions problems; determine necessary action
Check fuel for contaminants and quality; determine necessary action
Inspect and test fuel pumps and pump control systems for pressure, regulation, and volume; perform necessary action
Replace fuel filters
Inspect throttle body, air induction system, intake manifold and gaskets for vacuum leaks and/or unmetered air
Inspect and test fuel injectors
Verify idle control operation
Inspect the integrity of the exhaust manifold, exhaust pipes, muffler(s), catalytic converter(s), resonator(s), tail pipe(s), and heat shield(s); perform necessary action
Perform exhaust system back-pressure test; determine necessary action
Diagnose oil leaks, emissions, and driveability concerns caused by the positive crankcase ventilation (PCV) system; determine necessary action
Inspect, test and service positive crankcase ventilation (PCV) filter/breather cap, valve, tubes, orifices, and hoses; perform necessary action
Diagnose emissions and driveability concerns caused by the exhaust gas recirculation (EGR) system; determine necessary action
Inspect, test, service and replace components of the EGR system, including EGR tubing, exhaust passages, vacuum/pressure controls, filters and hoses; perform necessary action
Inspect and test electrical/electronical sensors, controls, and wiring of exhaust gas recirculation (EGR) systems; perform necessary action
Inspect and test mechanical components of secondary air injection systems; perform necessary action
Inspect and test electrical/electronically-operated components and circuits of air injection systems; perform necessary action
Inspect and test catalytic converter efficiency
Diagnose emissions and driveability concerns caused by the evaporative emissions control system; determine necessary action
Inspect and test components and hoses of the evaporative emissions control system; perform necessary action
Interpret diagnostic trouble codes (DTCs) and scan tool data related to the emissions control systems; determine necessary action
Adjust valves on engines with mechanical or hydraulic lifters
Remove and replace timing belt; verify correct camshaft timing
Remove and replace thermostat and gasket/seal
Inspect and test mechanical/electrical fans, fan clutch, fan shroud/ducting, air dams, and fan control devices; perform necessary action
Perform common fastener and thread repairs, to include: remove broken bolt, restore internal and external threads, and repair internal threads with a threaded insert
Perform engine oil and filter change
Identify hybrid vehicle internal combustion engine service precautions
ASSESSMENTS

PSSA Assessment Anchors Addressed: The teacher must be knowledgeable of the PDE Assessment Anchors and/or Eligible Content and incorporate them into this planned instruction. Current assessment anchors can be found at pde@state.pa.us.

Formative Assessments: The teacher will develop and use standards-based assessments throughout the course.

Portfolio Assessment: X Yes No

District-wide Final Examination Required: X Yes No

Course Challenge Assessment (Describe):
1. Instructor approved Portfolio
2. Automotive Technology NOCTI Written Exam
3. Automotive Technology NOCTI Performance Exam
5. AAA Ford Trouble Shooting Written Exam http://www.autoskills.com
7. Section 609 Certification for Refrigerant Recycling and Recovery Section 609 of the Clean Air Act requires that all technicians who open the refrigeration circuit in automotive air conditioning systems be certified. http://www.macsw.org/AM/Template.cfm?Section=Section609

WRITING TEAM:

Ron Scalse, Owner
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Mike Sherrard, Owner
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Mr. Charles Scott, Owner
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Mr. Steve Lucas, Manager
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Mr. Mark Lytle, Owner
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37 Euclid Ave.
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Mr. Melvin Jacobson, Manager
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1089 Market St. Ext.
Warren, Pa. 16365

Bill Chase, Owner
Chase Car Care
Sugar Grove, Pa. 16350

Craig Williams, Master Technician
Ed Shults
1658 North Market St.
Warren, Pa. 16365

**WCSD STUDENT DATA SYSTEM INFORMATION**

1. Is there a required final examination? X Yes No
2. Does this course issue a mark/grade for the report card? X Yes No
3. Does this course issue a Pass/Fail mark? Yes X No
4. Is the course mark/grade part of the GPA calculation? X Yes No
5. Is the course eligible for Honor Roll calculation? X Yes No
6. What is the academic weight of the course?
   _____ No weight/Non credit X Standard weight
   _____ Enhanced weight (Describe)