

Maintenance and Light Repair A

ADX 150/151 COURSE SYLLABUS 2016-2017 SCHOOL YEAR

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Office Hours: 7:45 am – 3:45 pm Monday-Friday
Program Name: Automotive Technology
KY Tech Course Name: Engine Repair
High School Credit: 1
KCTCS Course Name: Engine Repair
KCTCS Course Number: ADX 150 & ADX 151

Description: This course provides a series of lectures and demonstrations on the fundamentals of engine repair, troubleshooting, and engine operation and maintenance.

Textbook Used: Modern Automotive Technology 9th Edition

TASK LIST

- 1 Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.
- 2 Identify and interpret engine concern; determine necessary action.
- 3 Research applicable vehicle and service information, such as internal engine operation, vehicle service history, service precautions, and technical service bulletins.
- 4 Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels, and calibration decals).
- 5 Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action.
- 6 Diagnose engine noises and vibrations; determine necessary action.
- 7 Diagnose the cause of excessive oil consumption, unusual engine exhaust color, odor, and sound; determine necessary action.
- 8 Perform engine vacuum tests; determine necessary action.
- 9 Perform cylinder power balance tests; determine necessary action.
- 10 Perform cylinder cranking compression tests; determine necessary action.
- 11 Perform cylinder leakage tests; determine necessary action.
- 12 Remove and reinstall engine in a late model front-wheel or rear wheel drive vehicle (OBDII or newer); reconnect all attaching components and restore the vehicle to running condition.
- 13 Install engine covers using gaskets, seals and sealers as required.
- 14 Remove and reinstall cylinder heads and gaskets; tighten according to manufacturer's specifications and procedures.

- 15 Visually inspect cylinder head(s) for cracks; check gasket surface areas for warpage and leakage; check passage condition.
- 16 Inspect valve springs for squareness and free height comparisons; determine necessary action.
- 17 Replace valve stem seals on an assembled engine; inspect valve spring retainers, locks, and valve grooves; determine necessary action.
- 18 Inspect valve guides for wear; check valve stem-to-guide clearance; determine necessary action.
- 19 Inspect valves and valve seats; determine necessary action.
- 20 Check valve face-to-seat contact and valve seat concentricity (runout); determine necessary action.
- 21 Check valve spring assembled height and valve stem height; determine necessary action.
- 22 Inspect pushrods, rocker arms, rocker arm pivots and shafts for wear, bending, cracks, looseness, and blocked oil passages (orifices); determine necessary action.
- 23 Inspect hydraulic or mechanical lifters; determine necessary action.
- 24 Adjust valves (mechanical and hydraulic lifters).
- 25 Inspect camshaft drives (including gear wear and backlash, sprocket and chain wear); determine necessary action.
- 26 Inspect and replace timing belts (chains), overhead camdrive sprockets, and tensioners; check belt/chain tension; adjust as necessary.
- 27 Inspect camshaft for runout, journal wear, and lobe wear.
- 28 Inspect camshaft bearing surface for wear, damage, out-of-round, and alignment; determine necessary action.
- 29 Establish camshaft(s) timing and cam sensor indexing according to manufacturer's specifications and procedures.
- 30 Disassemble engine block; clean and prepare components for inspection and reassembly.
- 31 Inspect engine block for visible cracks, passage condition, core and gallery plug condition, and surface warpage; determine necessary action.
- 32 Perform common fastener and thread repair to include: remove broken bolt, restore internal and external threads, and repair internal threads with thread insert.
- 33 Inspect and measure cylinder walls/sleeves for damage, wear and ridges; determine necessary action.
- 34 Deglaze and clean cylinder walls.
- 35 Inspect and measure camshaft bearings for wear, damage, out-of-round, and alignment; determine necessary action.
- 36 Inspect crankshaft for end play, straightness, journal damage, keyway damage, thrust flange and sealing surface condition, and visual surface cracks; check oil passage condition; measure journal wear; check crankshaft sensor reluctor ring (where applicable); determine necessary action.
- 37 Inspect main and connecting rod bearings for damage and wear; determine necessary action.
- 38 Identify piston and bearing wear patterns that indicate connecting rod alignment and main

- bearing bore problems; determine necessary action.
- 39 Inspect and measure pistons; determine necessary action.
- 40 Remove and replace piston pin.
- 41 Inspect, measure, and install piston rings.
- 42 Inspect auxiliary (balance, intermediate, idler, counterbalance or silencer) shaft(s); inspect shaft(s) and support bearings for damage and wear; determine necessary action; reinstall and time.
- 43 Inspect or replace crankshaft vibration damper (harmonic balancer).
- 44 Assemble engine block assembly.
- 45 Perform oil pressure tests; determine necessary action.
- 46 Inspect oil pump gears or rotors, housing, pressure relief devices, and pump drive; perform necessary action.
- 47 Perform cooling system pressure tests; check coolant condition; inspect and test radiator, pressure cap, coolant recovery tank, and hoses; determine necessary action.
- 48 Inspect, replace, and adjust drive belts, tensioners, and pulleys; check pulley and belt alignment.
- 49 Inspect and replace engine cooling and heater system hoses.
- 50 Inspect, test, and replace thermostat and gasket.
- 51 Test coolant; drain and recover coolant; flush and refill cooling system with recommended coolant; bleed air as required.
- 52 Inspect, test, remove, and replace water pump.
- 53 Remove and replace radiator.
- 54 Inspect and test fan(s)(electrical or mechanical), fan clutch, and fan shroud and air dams.
- 55 Inspect auxiliary oil coolers; determine necessary action.
- 56 Inspect, test, and replace oil temperature and pressure switchers and sensors.
- 57 Perform oil and filter change.

Make Up Work: Test, Quizzes, and In Class and Lab Assignments

- Students can make up lost lab time from 3:00 pm to 3:45 pm with pre approval.
- Students will have three days to make up any excused absence and still received full credit.
- Students can be on homebound for no more than 2 weeks in any automotive class due to the majority of the class being focused on the lab.

Fees:

- Students will be furnished with one pair of safety glasses at the beginning of the year. If they become lost or broken students must purchase their own.
- Students will be provided Nitrile gloves to wear when deemed necessary.
- Students will be provided ear plugs to wear when using certain equipment or whenever deemed necessary by the instructor.

- Students must pay for any lost or damaged books at cost before graduation.
- Field trips may require a fee for registration and transportation.

Course Requirements:

1.	Successfully complete all written assignments/tests successfully.
2.	Complete all lab projects
3.	Abide by all Lab Safety Rules

Evaluation Procedures:

1.	Daily Grade
2.	Performance Tests
3.	Tests/Quizzes

Grade Assignment:

90 – 100	A	60 – 69	D
80 – 89	B	50 – 59	F
70 – 79	C		

Classroom and Shop Rules for Automotive

1. **NO TOBACCO** use of any kind
2. Cell phones and other electronic devices must be kept out of sight while in classroom area.
3. **NO FOOD OR DRINK** allowed in classroom or shop area unless authorized by instructor.
4. No inappropriate language or jesters.
5. Safety glasses must be worn at **ALL** times while in shop area.
6. No hitting, pushing, running or any other type of horseplay will be tolerated.
7. Appropriate clothing must be worn. No shorts, tank tops, open toe shoes, jewelry or loose fitting clothing permitted. Long hair must be pulled back while in shop area.
8. **NO USE** of shop tools, machinery or lifts without instructor supervision or approval.
9. Be prepared and on time for class each day.
10. **Cleaning is everyone's job.**

I will abide by these rules of the shop and classroom.

Student-_____

Parent or Guardian-_____

Teacher- Mr. Baldwin

Date-_____

I have read the syllabus and understand the requirements of this course.

Student/Date-_____

Parent or Guardian/Date-_____