NAME _____ SEMESTER_____YEAR_____

CERRITOS COLLEGE
AUTOMOTIVE TECHNOLOGY

ENGINE REPAIR

TASK LIST

	I. ENGINE REPAIR A. General Engine Diagnosis; Removal and Reinstallation (R & R)	LIVE WORK	DATE COMPLETED	INSTRUCTOR
1.	Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction. P-1			
2.	Research vehicle service information, including fluid type, internal engine operation, vehicle service history, service precautions, and technical service bulletins. P-1			
3.	Verify operation of the instrument panel engine warning indicators. P-1			
4.	Inspect engine assembly for fuel, oil, coolant and other leaks; determine needed action. P-1			
5.	Install engine covers using gaskets, seals, and sealers as required. P-1			
6.	Verify engine mechanical timing. P-1			
7.	Perform common fastener and thread repair, to include: remove broken bolt, restore internal and external threads, and repair internal threads with thread insert. P-1			
8.	Inspect, remove and/or replace engine mounts. P-2			
9.	Identify service precautions related to service of the internal combustion engine of a hybrid vehicle. P-2			
10.	Remove and reinstall engine on a newer vehicle equipped with OBD; reconnect all attaching components and restore the vehicle to running condition. P-3			
	B. Cylinder Head and Valve Train Diagnosis and Repair	**LIVE WORK**	**DATE COMPLETED**	**INSTRUCTOR**
1.	Remove cylinder head; inspect gasket condition; install cylinder head and gasket; tighten according to manufacturer's specifications and procedures. P-1			

2.	Clean and visually inspect a cylinder head for cracks; check gasket surface areas for warpage and surface finish; check passage condition. P-1			
3.	Inspect pushrods, rocker arms, rocker arm pivots and shafts for wear, bending, cracks, looseness, and blocked oil passages (orifices); determine needed action. P-2			
4.	Adjust valves (mechanical or hydraulic lifters). P-1			
5.	Inspect and replace camshaft and drive belt/chain; includes checking drive gear wear and backlash, end play, sprocket and chain wear, overhead cam drive sprocket(s), drive belt(s), belt tension, tensioners, camshaft reluctor ring/tone-wheel, and valve timing components; verify correct camshaft timing. P-1			
6.	Establish camshaft position sensor indexing. P-1			
7.	Inspect valve springs for squareness and free height comparison; determine necessary action. P-3			
8.	Replace valve stem seals on an assembled engine; inspect valve spring retainers, locks/keepers, and valve lock/keeper grooves; determine needed action. P-3			
9.	Inspect valve guides for wear; check valve stem-to-guide clearance; determine needed action. P-3			
10.	Inspect valves and valve seats; determine needed action. P-3			
11.	Check valve spring assembled height and valve stem height; determine needed action. P-3			
12.	Inspect valve lifters; determine needed action. P-2			
13.	Inspect and/or measure camshaft for runout, journal wear and lobe wear. P-3			
14.	Inspect camshaft bearing surface for wear, damage, out-of-round, and alignment; determine needed action. P-3			
	C. Engine Block Assembly Diagnosis and Repair	**LIVE WORK**	**DATE COMPLETED**	**INSTRUCTOR**
1.	Remove, inspect, and/or replace crankshaft vibration damper (harmonic balancer). P-1			
2.	Disassemble engine block; clean and prepare components for inspection and reassembly. P-1			

3.	Inspect engine block for visible cracks, passage condition, core and gallery plug condition, and surface warpage; determine needed action. P-2			
4.	Inspect and measure cylinder walls/sleeves for damage, wear, and ridges; determine needed action. P-2			
5.	Deglaze and clean cylinder walls. P-2			
6.	Inspect and measure camshaft bearings for wear, damage, out-of-round, and alignment; determine needed action. P-3			
7.	Inspect crankshaft for straightness, journal damage, keyway damage, thrust flange and sealing surface condition, and visual surface cracks; check oil passage condition; measure end play and journal wear; check crankshaft position sensor reluctor ring (where applicable); determine needed action. P-1			
8.	Inspect main and connecting rod bearings for damage and wear; determine needed action. P-2			
9.	Identify piston and bearing wear patterns that indicate connecting rod alignment and main bearing bore problems; determine needed action. P-3			
10.	Inspect and measure piston skirts and ring lands; determine needed action. P-2			
11.	Determine piston-to-bore clearance. P-2			
12.	Inspect, measure, and install piston rings. P-2			
13.	Inspect auxiliary shaft(s) (balance, intermediate, idler, counterbalance and/or silencer); inspect shaft(s) and support bearings for damage and wear; determine needed action; reinstall and time. P-2			
14.	Assemble engine block. P-1			
	D. Lubrication and Cooling Systems Diagnoses and Repair	**LIVE WORK**	**DATE COMPLETED**	**INSTRUCTOR**
1.	Perform cooling system pressure and dye tests to identify leaks; check coolant condition and level; inspect and test radiator, pressure cap, coolant recovery tank, heater core, and galley plugs; determine needed action. P-1			
2.	Identify causes of engine overheating. P-1			
3.	Inspect, replace, and/or adjust drive belts, tensioners, and pulleys; check pulley and belt alignment. P-1			

4.	Inspect and/or test coolant; drain and recover coolant; flush and refill cooling system; use proper fluid type per manufacturer specifications; bleed air as required. P-1			
5.	Inspect, remove, and replace water pump. P-2			
6.	Remove and replace radiator. P-2			
7.	Remove, inspect, and replace thermostat and gasket/seal. P-1			
8.	Inspect and test fan(s), fan clutch (electrical or mechanical), fan shroud, and air dams; determine needed action. P-1			
9.	Perform oil pressure tests; determine needed action. P-1			
10.	Perform engine oil and filter change; use proper fluid type per manufacturer specification. P-1			
11.	Inspect auxiliary coolers; determine needed action. P-3			
12.	Inspect, test, and replace oil temperature and pressure switches and sensors. P-2			
13.	Inspect oil pump gears or rotors, housing, pressure relief devices, and pump drive; perform needed action. P-2			