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	Secondary Competency Task List	
100	**WORKPLACE SAFETY.**	
101	Interpret workplace safety and SDS sheets.	
102	Demonstrate how to lift and move heavy objects.	
103	Demonstrate how to handle and store flammable materials and toxic substances.	
104	Explain the purpose of OSHA and how it promotes safety on the job	
105	Demonstrate and explain appropriate safety precautions to take around job-site hazards.	
106	Demonstrate and properly wear personal protective equipment (safety goggles, hearing protection and respiratory protection.	
107	Describe fire prevention techniques.	
108	Follow safety rules for ECP (Exposure Control Procedures) for blood borne pathogens.	
200	**BASIC ELECTRICAL PRINCIPLES AND CIRCUIT TESTING.**	
201	Demonstrate safe work habits when working with electrical systems.	
202	Demonstrate how to interpret electrical circuit and wiring diagrams while making correct electrical connections.	
203	Use a meter to measure resistance, continuity, amperage and voltage.	
204	Solve problems using Ohm's Law.	
205	Explain the proper procedure for battery disposal based on EPA and local ordinances and resistance.	
206	Describe series and parallel circuits and explain the different types of circuit failures.	
207	Identify terminals and connectors used in electrical systems.	
208	Describe and perform the diode test.	
209	Identify electrical wire sizes and selection based on an anticipated current load.	
210	Demonstrate applicable test procedures for testing series and parallel circuits.	
211	Check current flow in electrical systems and components	
212	Inspect, test and replace fusible links, fuses and circuit breakers.	
213	Demonstrate knowledge of American Wire Gauge (AWG) wiring codes.	
214	Inspect a low-oil alert system.	
215	Solder a current carrying wire.	
300	**COOLING SYSTEM OPERATING PRINCIPLES, TROUBLESHOOTING AND REPAIR PROCEDURES.**	

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301	Demonstrate knowledge of the concept of heat transfer and the purpose of a cooling system.	
302	Perform a cooling system flush and cleaning on a liquid cooled engine.	
303	Remove, service and replace a water pump hose and replace thermostat.	
304	Identify the components and function of a liquid cooled engine.	
305	Properly pressure-test a liquid-cooled cooling system.	
306	Describe major causes of liquid-cooled engine overheating.	
307	Inspect the cooling system for debris, leaks and damage.	
400	**FUEL SYSTEM OPERATING PRINCIPLES, TROUBLESHOOTING AND REPAIR PROCEDURES.**	
401	Identify the basic types of fuel systems used in power equipment.	
402	Identify the function of each component in the fuel system including carburetor, fuel filter, fuel pump, and electronic fuel injector.	
403	Identify types of carburetor designs and their functions, using proper terms.	
404	Use proper terms to describe the function of vacuum-feed, diaphragm, float, rotary, and slide valve carburetors.	
405	Identify and describe the idle fuel circuit and the main fuel circuit.	
406	Use proper terms to describe the "venturi" principle, and variable venturi carburetors.	
407	Describe fuel enrichment devices including choke types, purging systems, and primers.	
408	Describe the function of a fixed orifice jet, high speed nozzle, emulsion tube, and purging system.	
409	Identify the common types of fuel filters and describe the difference between micron and mesh.	
410	Explain the theory, function, and components of electronic fuel injection (EFI).	
411	Explain the theory, function, and components of gaseous fuels.	
412	Identify types and grades of gasoline used in power equipment.	
413	Describe how fuel additives protect power equipment placed in seasonal storage.	
414	Inspect, disassemble, clean, and reassemble internal carburetor parts for wear.	
415	Remove, service and replace a carburetor on a small gasoline engine.	
416	Remove, service, and replace a fuel system's air filter.	
417	Remove, service and replace a fuel pump.	
418	Adjust carburetor choke linkage.	
419	Adjust carburetor mixture screws per OEM specifications.	
420	Adjust carburetor float level, adjust carburetor metering levers, remove, replace and repair fuel lines.	
421	Remove and replace a fuel tank, filters, caps and lines.	
422	Adjust an engine's idle speed after servicing a carburetor.	

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423	Check the fuel pump pressure.	
424	Pressure test the carburetor.	
425	Operate the engine to check for proper starting and acceleration.	
426	Differentiate hunting/surging symptom between the fuel system and governor system.	
427	Properly assemble an air intake.	
428	Remove and replace an intake manifold.	
500	**EXHAUST SYSTEM OPERATION AND REPAIR PROCEDURES.**	
501	Describe equipment problems that can occur from operating equipment with a removed or damaged exhaust system.	
502	State the danger of operating a power product in a closed area.	
503	Describe the purpose of an exhaust deflector and describe the purpose of a spark arrestor screen.	
504	Describe exhaust system nomenclature and function as well as types and terms associated with exhaust systems.	
505	Describe the theory and function of a single stage catalyst (catalytic converters).	
506	Describe the proper service cleaning procedures for exhaust ports and spark arrestor screens.	
507	Inspect, remove, service and replace an exhaust system.	
508	Diagnose, service, and replace an oxygen sensor.	
600	**MEASURING AND TRADE RELATED MATHEMATICS**	
601	Read a standard and a metric ruler	
602	Read and use a standard and metric micrometer	
603	Read and use a standard and metric dial indicator	
604	Use a standard and metric torque wrench	
605	Use a standard metric dial caliper.	
606	Calculate displacement and horse power.	
607	Calculate work, power, torque, area and volume.	
700	**IDENTIFY AND USE HAND TOOLS.**	
701	Identify and demonstrate the safe use of common hand tools used in the repair of outdoor power equipment.	
702	Identify and demonstrate the safe use of specialty tools used in the repair of outdoor power equipment.	
703	Identify and demonstrate the safe use of hand, electric, air and hydraulic tools.	

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800	**IDENTIFY AND USE FASTENERS.**	
801	Identify, select and install various fasteners according to specifications.	
802	Replace damaged internal threads using a thread repair system.	
803	Repair damaged internal and external threads, using a tap and die.	
804	Demonstrate the use of a thread extraction tool to remove a broken fastener.	
900	**DEMONSTRATE WELDING AND CUTTING TECHNIQUES.**	
901	State and follow safety rules for using an electric welder.	
902	Wear personal protective equipment.	
903	Adjust welding amperage for a specific welding repair.	
904	Weld a broken metal part on a piece of outdoor power equipment.	
905	Light and adjust the flame on a cutting torch.	
906	Heat and cut with an oxyacetylene torch.	
1000	**2-STROKE CYCLE ENGINE OPERATING PRINCIPLES, TROUBLESHOOTING AND REPAIR PROCEDURES.**	
1001	Diagnose performance problems in a 2-cycle gasoline engine	
1002	Explain a manufacturer's model number, serial number and engine type number for two-cycle engines.	
1003	Check engine for top end compression.	
1004	Check engine for base/ primary compression (bottom end).	
1005	Identify the component parts in a short block of a 2-cycle engine and explain their purposes.	
1006	Inspect the fuel system for proper operation.	
1007	Explain 2- cycle engine operating theory.	
1008	Perform a carburetor pressure test.	
1009	Inspect the ignition system for proper operation using a spark tester.	
1010	Identify the types of 2-stroke cycle valves.	
1011	Inspect the exhaust port for carbon obstructions.	
1012	Operate the engine to check for proper starting and power output under load.	
1100	**4-STROKE CYCLE ENGINE OPERATING PRINCIPLES, TROUBLESHOOTING AND REPAIR PROCEDURES.**	
1101	Disassemble the block.	

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1102	Explain a manufacturer's model number, serial number and engine type number for 4-cycle engines.	
1103	Explain 4-cycle engine operating theory.	
1104	Remove, inspect and replace an oil seal..	
1105	Inspect balance system; inspect shaft(s) and bearings for damage and wear valve guides for wear.	
1106	Inspect and measure camshaft bearings for wear and damage.	
1107	Measure crankshaft end play and run-out, and repair crankshaft if damaged.	
1108	Inspect rings and valve train parts; valves, rocker arms, lifters, studs, and push rods.	
1109	Inspect valve guides for wear.	
1110	Inspect valves and valve seals; resurface or replace.	
1111	Replace valve stem seals.	
1112	Use a valve spring compressor to install valve springs.	
1113	Adjust valves (mechanical), and hydraulic lifters.	
1114	Measure cylinder bore and compare against OEM specifications	
1115	Ream a cylinder ridge and deglaze.	
1116	Perform a cylinder balance test and demonstrate understanding of findings	
1117	Perform a cylinder compression test.	
1118	Perform a cylinder leak-down test.	
1119	Install a new crankshaft, with bearings, if needed.	
1120	Install a piston using a ring compressor.	
1121	Install new rings; check end and side clearance.	
1122	Verify camshaft timing according to manufacturer's specifications.	
1123	Install all gaskets where needed, according to specifications.	
1124	Torque fasteners according to manufacturer's specifications	
1125	Install and adjust linkages and controls.	
1126	Initiate start-up procedures for test run.	
1200	**CONDUCT AN ENGINE FAILURE ANAYLSIS.**	
1201	Classify failures into 5 major categories; electrical, fuel, ignition, lubrication, and compression.	
1202	Identify the effects of insufficient lubrication on engine components; piston cylinders, etc.	
1203	Identify and describe engine failures caused by the breakdown of fuel.	
1204	Identify the effects of overheating on engine component parts.	

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1205	Define detonation, pre-ignition and effects on engine components.	
1206	Identify engine failure caused by lean mixture of fuel.	
1207	Identify the effects of over speeding on engine component parts.	
1208	Identify the signature "breakage" of a connecting rod on a failed engine.	
1209	Identify exhaust port piston scoring and large end bearings due to over speeding.	
1210	Identify the effects of excessing vibration on engine block and mounting base.	
1211	Inspect a damaged engine and identify the symptoms, types and causes of failures.	
1300	**SERVICE ELECTRICAL AND MANUAL STARTING SYSTEMS.**	
1301	Identify and describe the parts of a recoil starting system.	
1302	Disassemble starter housing.	
1303	Replace a starter spring.	
1304	Replace a manual starter rope.	
1305	Troubleshoot a starting / safety interlock circuit.	
1306	Remove, service and replace a Direct Current starter.	
1307	Remove, service and replace and Alternating Current starter.	
1308	Identify and describe the components of a DC starting system.	
1309	Perform a 12-volt DC starter motor current draw test.	
1310	Remove, test and replace a starter relay or solenoid.	
1400	**IGNITION SYSTEM OPERATING PRINCIPLES, FAILURE DIAGNOSIS AND REPAIR PROCEDURES.**	
1401	Identify, remove, service and replace battery ignition system components	
1402	Identify, remove, service and replace electronic ignition system components.	
1403	Remove, test and replace a coil or electronic ignition.	
1404	Check and set ignition timing.	
1405	Check engine RPM.	
1406	Test an ignition system using a spark tester.	
1407	Inspect the engine for a partially-sheared flywheel key.	
1408	Remove, inspect and replace points and condenser.	
1409	Remove, replace, and test an ignition armature assembly (ignition coil, ignition).	

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1410	Test and replace high tension lead(s).	
1411	Test the solid-state transistor-controlled discharge system.	
1412	Test a capacitive discharge ignition system.	
1413	Demonstrate timing procedure for an engine with ignition points.	
1414	Demonstrate timing procedures on an engine with a solid state/ electronic ignition system.	
1415	Measure primary and secondary resistance.	
1416	Check/replace an engine ignition kill switch.	
1500	**CHARGING SYSTEM OPERATING PRINCIPLES, FAILURE DIAGNOSIS AND REPAIR PROCEDURES.**	
1501	Explain storage battery theory and perform maintenance.	
1502	Identify types of charging systems including an under flywheel alternator and a belt drive alternator.	
1503	Perform a current drain test using a DC shunt or its equivalent.	
1504	Troubleshoot a charging circuit.	
1505	Test a charging system.	
1506	Test a voltage regulator.	
1507	Test an alternator's output.	
1508	Remove and replace an alternator, a voltage rectifier, and a diode.	
1600	**LUBRICATION SYSTEM OPERATING PRINCIPLES, FAILURE DIAGNOSIS AND REPAIR PROCEDURES.**	
1601	Identify types of filters used on power equipment.	
1602	Interpret charts that outline oil applications.	
1603	Change engine oil and filter on a variety of outdoor power equipment.	
1604	Select proper oil and grade.	
1605	Prepare a fuel/oil mixture for a 2-cycle engine.	
1606	Service a crankcase breather assembly.	
1607	Describe lubrication systems and their functions.	
1608	Describe API oil ratings and the meaning of SAE viscosity ratings.	
1609	Describe the standard classification of 2-cycle oils.	
1610	List common oil contaminants.	
1611	Describe differences between splash lubrication systems and a pressure lubrication system.	
1612	Describe the operation of an oil filtration system.	

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1613	Describe methods of checking the oil level in an engine.	
1614	Explain the need for positive crank case ventilation.	
1615	Identify the components and function of a crankcase ventilation breather assembly	
1616	Perform an oil pressure test.	
1700	**GOVERNOR SYSTEM OPERATING PRINCIPLES, FAILURE DIAGNOSIS AND REPAIR PROCEDURES.**	
1701	Perform static and dynamic governor adjustments.	
1702	Remove, service, and replace pneumatic and mechanical governor.	
1703	Check top no-load speed object governor as needed.	
1800	**BRAKE SYSTEM OPERATING PRINCIPLES, FAILURE DIAGNOSIS AND REPAIR PROCEDURES.**	
1801	Inspect, remove, service and repair mechanical brake systems.	
1802	Inspect, remove, service and repair hydraulic brake systems.	
1803	Inspect, remove service and repair drum and disc brakes.	
1804	Demonstrate knowledge of the hydraulic theory	
1805	Change hydraulic fluid.	
1900	**CLUTCH AND DRIVE SYSTEM OPERATING PRINCIPLES, FAILURE DIAGNOSIS AND REPAIR PROCEDURES.**	
1901	Inspect, service or replace belts and tensioning devices.	
1902	Inspect, service or replace centrifugal clutches.	
1903	Inspect, service or replace clutch discs.	
1904	Inspect, service or replace sprockets and chains.	
1905	Inspect, service or replace an electric power take-off.	
1906	Inspect, service or replace universal joints.	
2000	**PARTS MANAGEMENT, INVOICING AND RECORDKEEPING.**	
2001	Interpret illustrations, graphs, diagrams, and tables in repair manuals.	
2002	Use reference materials, service manuals, and parts tables to find parts.	
2003	Take inventory of parts in stock.	
2004	Determine parts and specifications using a computerized or microfiche parts reference database.	
2005	Complete a service order form.	

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2006	Interpret time and flat rate information.	
2007	Order materials and supplies from a catalog.	