



Powersports

Career Cluster	Transportation, Distribution & Logistics
Course Code	20111
Prerequisite(s)	None
Credit	None
Program of Study and Sequence	Any Foundation course – Powersports – Any pathway course - Capstone
Student Organization	SkillsUSA
Coordinating Work-Based Learning	Job Shadow
Industry Certifications	N/A
Dual Credit or Dual Enrollment	See: https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Transportation, Distribution & Logistics Cluster Endorsement; Automotive Technology Pathway Endorsement *Automotive Technology; *7-12 Technology Education
Resources	N/A

Course Description

Powersports is an introductory course for students interested in obtaining skills needed to maintain and repair powersports vehicles. Students will study the various powersports types, parts identification, and engine operation along with other systems and components found in powersports vehicles. Students will inspect, disassemble, reassemble, and troubleshoot an internal combustion engine and all other systems found in powersports.

Program of Study Application

Powersports is a cluster course within the Transportation, Distribution and Logistics career cluster.

Course Standards

PV 1: Students will demonstrate shop and tool safety.	
<i>Webb Level</i>	<i>Sub-indicator</i>
One Recall & Reproduction	PV 1.1 Examine basic shop safety using Occupational Safety and Health Administration (OSHA) standards. <ul style="list-style-type: none"> ● Summarize the proper use of Safety Data Sheets (SDS) ● Create a safety portfolio ● Locate the fire extinguisher, fire blankets, and emergency exits ● Never have an open flame near flammable liquids ● Do not refuel engine while in operation ● Demonstrate proper start up and shutoff procedures (be aware of surroundings when pull-starting small gas engine (SGE)) ● Wear appropriate eye and hearing protection ● Wear appropriate clothing and shoe protection
Two Skill/Concept	PV 1.2 Demonstrate proper use of hand and power tools. <ul style="list-style-type: none"> ● Perform a general tool test (name and function of tool being used, proper use of each tool, care and storage) ● Review Torque wrench settings and usage ● Spark test tools (Use appropriate spark tester to check spark)

PV 2: Students will demonstrate independent and teamwork skills as well as explore career opportunities within the industry.	
<i>Webb Level</i>	<i>Sub-indicator</i>
Three Strategic Thinking	PV 2.1 Participate in student leadership activities.
Four Extended Thinking	PV 2.2 Utilize career guidance tools to research and report on career opportunities.
Three Strategic Thinking	PV 2.3 Develop a teamwork project.

PV 3: Students will understand and apply appropriate business practices.	
<i>Webb Level</i>	<i>Sub-indicator</i>
Three Strategic Thinking	PV 3.1 Demonstrate the importance of, and the procedures for, maintaining accurate records.
Three Strategic Thinking	PV 3.2 Apply concept and application of ethical business practices.
Three Strategic Thinking	PV 3.3 Apply excellent customer relations practices.

PV 4: Students will troubleshoot an internal combustion engine.	
<i>Webb Level</i>	<i>Sub-indicator</i>
Four	PV 4.1 Implement strategic diagnostic procedures.

Extended Thinking	
Two Skill/Concept	<p>PV 4.2 Conduct preventative maintenance on an internal combustion engine.</p> <ul style="list-style-type: none"> ● Inspect and change oil and oil filter ● Inspect and change air filter ● Disassemble, clean, and inspect fuel pump ● Disassemble, clean, and inspect carburetor
Three Strategic Thinking	<p>PV 4.3 Analyze the functions and operations of a fuel system related to powersports vehicles.</p> <ul style="list-style-type: none"> ● Complete fuel pressure test of system utilizing a fuel pump ● Set carburetor float height ● Adjust both low and high idle circuits on carburetor engines ● Complete fuel injector function test on fuel injected engines
Three Strategic Thinking	<p>PV 4.4 Diagnose fuel system problems.</p> <ul style="list-style-type: none"> ● Test and determine needed repair on fuel system ● Inspect and determine needed repair on air cleaner system
Three Strategic Thinking	<p>PV 4.5 Perform fuel system service.</p> <ul style="list-style-type: none"> ● Remove and replace the fuel tank, fuel lines and fuel filter system ● Service oil-bath or foam type air cleaner ● Reassemble and adjust a carburetor ● Reassemble and install fuel pump
Four Extended Thinking	<p>PV 4.6 Analyze the function and operation of emission systems related to powersports vehicles.</p> <ul style="list-style-type: none"> ● Research EPA emissions standards and requirements and ● Explain how emissions regulations affect the small engine service industry
Four Extended Thinking	<p>PV 4.7 Diagnose emission systems relating to powersports vehicles.</p>

PV 5: Students will properly test, diagnose, service, and repair charging and electrical systems.	
<i>Webb Level</i>	<i>Sub-indicator</i>
Two Skill/Concept	<p>PV 5.1 Inspect and repair battery problems.</p> <ul style="list-style-type: none"> ● 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 ● Inspect, clean, fill, and/or replace battery, battery cables, connectors, clamps and hold-downs ● Perform battery charge ● Start a vehicle using jumper cables and a battery or auxiliary power supply
Two Skill/Concept	<p>PV 5.2 Diagnose and repair starter.</p> <ul style="list-style-type: none"> ● Perform starter current draw tests; determine necessary action ● Perform starter circuit voltage drop tests; determine necessary action ● Inspect and test starter relays and solenoids; determine necessary action ● Remove and replace starter
Two Skill/Concept	<p>PV 5.3 Diagnose and repair charging system.</p> <ul style="list-style-type: none"> ● Perform charging system output test; determine necessary action ● Remove and replace generator (alternator)

	<ul style="list-style-type: none"> ● Diagnose the cause of dim, or no light operation; determine necessary action ● Inspect, replace, and aim headlights and bulbs
Two Skill/Concept	PV 5.4 Understand safety aspects of supplemental restraint systems (SRS), electronic brake control systems and hybrid vehicle high voltage circuits.
Two Skill/Concept	PV 5.5 Understand and demonstrate awareness of the safety aspects of high voltage circuits (such as high intensity discharge [HID] lamps, ignition systems, injection systems, etc.).
Two Skill/Concept	PV 5.6 Utilize safe procedures for operating electric vehicles and systems.

PV 6: Inspect, diagnose and repair drivetrain, transmission, axles and final drive components.	
<i>Webb Level</i>	<i>Sub-indicator</i>
Two Skill/Concept	PV 6.1 Demonstrate understanding of drivetrain components to include primary transmission and final drive components. <ul style="list-style-type: none"> ● Drain transmission fluid ● Visually inspect the amount of debris in oil pan ● Remove filter and install new filter ● Install the proper fluid to the proper level
Two Skill/Concept	PV 6.2 Diagnose and repair drive train and axles. <ul style="list-style-type: none"> ● Diagnose fluid loss, level, and condition concerns; determine necessary action ● Drain and fill transmission/transaxle and final drive unit ● Identify and inspect clutch pedal linkage, cables, automatic adjuster mechanisms, brackets, bushings, pivots, and springs; determine necessary action ● Identify and inspect hydraulic clutch slave and master cylinders, lines and hoses; determine necessary action ● Bleed clutch hydraulic system ● Inspect constant velocity (CV) joint boots ● Remove and replace rear wheel drive shaft

PV 7: Students will repair suspension and steering.	
<i>Webb Level</i>	<i>Sub-indicator</i>
Two Skill/Concept	PV 7.1 Diagnose suspension and steering; determine necessary action. <ul style="list-style-type: none"> ● Determine proper power steering fluid types ● Flush, fill and bleed power steering system ● Diagnose power steering fluid leakage; determine necessary action. ● Lubricate suspension and steering systems ● Inspect, remove and replace shock absorbers ● Inspect and install stabilizer bar bushings, brackets, and links. ● Inspect and install strut cartridge or assembly, coil spring, insulators (silencers), and upper strut mount ● Perform pre-alignment inspection and measure vehicle ride height; determine necessary action

	<ul style="list-style-type: none"> ● Demonstrate knowledge of the principles of steering geometry using caster, camber and toe
Two Skill/Concept	<p>PV 7.2 Inspect and repair tire and wheel assembly.</p> <ul style="list-style-type: none"> ● Diagnose tire wear patterns; determine necessary action ● Diagnose wheel/tire vibration, shimmy, and noise; determine necessary action ● Identify vehicles equipped with a tire pressure monitoring system (TPMS) ● Demonstrate knowledge of service considerations of vehicles equipped with a TPMS ● Rotate tires according to manufacturer's recommendations ● Balance wheel and tire assembly (static and dynamic) ● Dismount, inspect, and remount tire on wheel ● Repair tire using internal patch ● Reinstall wheel; torque lug nuts

PV 8: Students will inspect, diagnose and repair brake assembly.	
<i>Webb Level</i>	<i>Sub-indicator</i>
Two Skill/Concept	<p>PV 8.1 Diagnose and repair brake fluid system.</p> <ul style="list-style-type: none"> ● Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging or wear; tighten loose fittings and support; determine necessary action ● Select, handle, and fill brake fluids to proper level ● Bleed brake system ● Test brake fluid for contamination; determine necessary action
Two Skill/Concept	<p>PV 8.2 Inspect and repair brake assemblies.</p> <ul style="list-style-type: none"> ● Remove, clean, inspect and measure brake drums; determine necessary action ● Refinish brake drum; measure final drum diameter ● Remove, clean, inspect brake shoes, springs, pins, clips, levers, adjuster/self-adjuster, 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
Two Skill/Concept	<p>PV 8.3 Inspect and repair brake indicator light components.</p> <ul style="list-style-type: none"> ● Check parking brake and indicator light system operation; determine necessary action ● Check operation of brake stop light system; determine necessary action ● Replace tapered roller wheel bearing and race ● Clean, inspect, lubricate, install and adjust wheel bearing ● Identify and inspect electronic brake control system components; determine necessary action ● Demonstrate knowledge of how the brake hydraulic failure warning light operates

PV 9: Students will inspect, diagnose and repair heating and air conditioning.	
<i>Webb Level</i>	<i>Sub-indicator</i>
Two Skill/Concept	PV 9.1 Identify and visually inspect A/C system components. <ul style="list-style-type: none"> ● Locate refrigerant label and identify specified refrigerant type (e.g., R-12, R-134a) ● Conduct preliminary performance test of A/C system and determine necessary action ● Conduct performance test of the heater/ventilation system ● Inspect and replace cabin air filter

PV 10: Students will inspect, diagnose and improve engine performance.	
<i>Webb Level</i>	<i>Sub-indicator</i>
Two Skill/Concept	PPV 10.1 Perform the necessary tests and repairs to improve engine performance. <ul style="list-style-type: none"> ● Perform engine cranking and running vacuum tests; determine necessary action ● Perform cylinder power balance test; determine necessary action ● Perform cylinder cranking compression test; determine necessary action ● Perform cylinder leakage test; determine necessary action ● Verify engine operating temperature; determine necessary action ● Retrieve and record stored diagnostic trouble codes, On-Board Diagnostics (OBD) monitor status and freeze frame data; clear codes when applicable ● Obtain and interpret scan tool data ● Remove and replace secondary ignition components ● Remove and replace thermostat and gasket/seal ● Perform common fastener and thread repair, to include: removing broken bolt, restoring internal and external threads, and repairing internal threads with a threaded insert