

Predator 212cc Engine Project

Student Guide



[Complete Playlist →](#)

Crescent Valley High School

What You're Doing

- ✓ **Disassembly** — Carefully remove all engine components to understand how they work
- ✓ **Inspection** — Examine each part and record detailed measurements
- ✓ **Measurement** — Verify all components meet factory specifications
- ✓ **Reassembly** — Put everything back together in precise order
- ✓ **Verification** — Adjust critical systems and start the engine

Key Facts

Time Required: 20-30 hours over 6 weeks

Difficulty Level: Moderate (precision matters!)

What You'll Learn: How 4-stroke engines actually work

Real Skills: Mechanical precision, troubleshooting, documentation

Non-Negotiable Safety

Before Starting	<ul style="list-style-type: none">■ Spark plug removed■ Fuel drained■ Oil drained■ Engine is COLD■ No working alone
During Work	<ul style="list-style-type: none">■ Safety glasses on■ Tools used correctly■ Oil cleaned immediately■ Ask before trying new steps
STOP Work If	<ul style="list-style-type: none">■ Unsure about procedure■ Hearing odd sounds■ Fuel/oil leaking■ Something won't fit

Remember: Safety is not optional. These rules protect you.

Complete Video Schedule

How 4-Stroke Engines Work — 20 min

Week 1 - Foundation



Watch: <https://www.youtube.com/watch?v=ryUB0W72VJ0...>

Key:

- 0:00-4:00: 4-stroke cycle overview
- 4:00-12:00: Valve operation
- 12:00-20:00: Component functions

Tear Down - Part 1 — 24 min

Week 1 - Day 1



Watch: <https://www.youtube.com/watch?v=ha6K8Bn9ELo...>

Key:

- 0:00-2:00: Fuel draining (CRITICAL)
- 5:00-8:00: Spark plug removal
- 12:00-24:00: Initial disassembly

Tear Down - Part 2 — 23 min

Week 1 - Day 2



Watch: <https://www.youtube.com/watch?v=NrXomEJPzqM...>

Key:

- 0:00-5:00: Flywheel removal
- 5:00-12:00: Stator removal
- 12:00-23:00: Deep disassembly

Installing Piston — 7 min

Week 2 - Day 1



Watch: <https://www.youtube.com/watch?v=j2UvZuUYUEU...>

Key:

- 0:00-2:00: Ring sequence
- 2:00-4:00: Gap verification
- 4:00-7:00: Installation

Valve Head & Details — 8 min

Week 2 - Day 2



Watch: <https://www.youtube.com/watch?v=Td-8jDXZ6KA...>

Key:

- 0:00-3:00: Valve ID
- 3:00-6:00: Condition check
- 6:00-8:00: Spring mechanism

Internal Reassembly — 15 min

Week 3 - Day 1



Watch: <https://www.youtube.com/watch?v=4sKli20SJNl...>

Key:

- 5:00-10:00: Rod bolt torque
- 10:00-13:00: TIMING MARKS (Critical!)
- 13:00-15:00: Cover assembly

Head Reassembly — 11 min

Week 3 - Day 2



Watch: <https://www.youtube.com/watch?v=RFEy7g0iDEg...>

Key:

- 0:00-3:00: Valve installation
- 3:00-7:00: Spring compressor
- 7:00-11:00: Head bolts (17-22 ft-lbs)

VALVE LASH (MOST CRITICAL) — 8 min

Week 3 - Day 3



Watch: <https://www.youtube.com/watch?v=ixVMH0u7C34...>

Key:

- 0:00-2:00: TDC positioning
- 2:00-4:00: Feeler gauge
- SPECS: Intake 0.003-0.005 | Exhaust 0.004-0.006

Exterior Reassembly — 36 min

Week 3 - Day 4



Watch: <https://www.youtube.com/watch?v=y6wgEWFvBWQ...>

Key:

- 0:00-8:00: Rocker arms
- 8:00-15:00: Valve cover
- 15:00-36:00: Carburetor & fuel

Flywheel Installation — 3 min

Week 3 - Day 5



Watch: <https://www.youtube.com/watch?v=t-kKTW-2ZqE...>

Key:

TORQUE: 25-30 ft-lbs
Use helper if needed
Verify before startup

What to Document

You must record everything in your worksheet. Here's what matters:

- ✓ **Measurements:** Ring gaps, bore diameter, all clearances
- ✓ **Component Condition:** Wear patterns, scoring, cleanliness
- ✓ **Torque Values:** Actual torque used for each critical bolt
- ✓ **Valve Lash:** Every attempt and final adjustment
- ✓ **Photos:** Position before disassembly, final assembly
- ✓ **Questions:** What confuses you — helps learning
- ✓ **Reflection:** What surprised you? What learned?

Documentation Location:

[worksheets/Student-Worksheet.md](#)

How You'll Be Graded

Component	Worth	What We're Checking
Safety Adherence	25%	Did you follow all safety procedures?
Procedural Accuracy	30%	Did you do steps in the right order?
Measurements & Docs	25%	Did you record everything clearly?
Engine Startup	15%	Does it actually start and run?
Reflection & Learning	5%	Do you understand what you did?

Success = Following procedures + Documenting + Engine runs

Getting Help

When You Get Stuck

Don't understand a step? Re-watch the video and check the Teaching Guide

Engine won't start? Check: Spark → Fuel → Valve Lash

Measurement confusion? Use the feeler gauge guide

Valve lash problems? Watch Part 7 again (2-3 times)

Lost or confused? Stop work and ask your instructor

Key Resources



FAQ & Troubleshooting
docs/FAQ.md



Teaching Guide
docs/02-Teaching-Guide.md



Safety Checklists
docs/01-Quick-Reference-Checklists.md



Torque Specs
docs/05-Torque-Specifications.md

Asking for help shows you're taking this seriously!