

Bad Timing

Duty Area: Servicing Valves on Four-Stroke Engines

Billy is an experienced small-engine technician at a local small-engine repair shop. A customer brings in a push mower and says his cousin tried to tune up the engine, but now he can't pull the starter rope.

Billy takes the engine and tells the customer that he will call when the service is completed, and the engine is running again. Upon investigation, Billy finds that the customer's cousin had simply failed to time the engine correctly and that the exhaust valve was not opening at the correct time. This makes the starter rope difficult to pull. Billy corrects the timing issue and is able to start the engine with the starter rope.

Big Question:

How did Billy's knowledge of the proper operation of the valves and timing of the valves during each engine stroke help him solve the customer's problem?

Focused Questions:

- Why would a closed exhaust valve cause the starter rope to be difficult to pull?
- What would cause the starter rope to be too easy to pull?
- During which stroke should the exhaust valve be open?
- During which stroke should the intake valve be open?
- During which stroke or strokes should they both be closed?

Project-Based Assessment:

Set up an engine troubleshooting scenario that allows students to assess the issue with the valves of a small engine. After they assess the problem, they must give a cost estimate of the work that needs to be done, based on an hourly rate provided by the instructor.