

**2013 Wyoming State FFA CDE
Agricultural Technology and Mechanical Systems
Energy Systems – Small Gas Engine Skill**

You are an employee at the local feed mill and processing facility in your hometown. Last night a sudden unexpected storm flooded your neighbor’s lagoon at his feedlot operation and the overflow is threatening a storage facility that you use to store bagged feed prior to shipping. The feedlot owner’s pump is not able to meet the demand in order to lower the level of the lagoon in a timely manner. You have recently purchased a new small engine to be mounted on an old pumping unit that you recently obtained. In order to help keep the flow from the feedlot lagoon from reaching your storage facility, you offer to help the owner of the feedlot. Before you can help, you must ensure that the engine you purchased is compatible with the pump specifications. In order to obtain the proper specifications from the repair manual you must first identify the Model, Type, and Code of your engine. **Be sure to include both the minimum and maximum tolerances where necessary as well as units of measure!**

Model: _____ Type: _____ Code: _____

1. Using the tools provided, determine the cylinder displacement (CD) for the exposed cylinder.

$$CD = \frac{\pi \times \text{Bore}^2 \times \text{Stroke}}{4}$$

(The answer must be expressed in cubic inches) Stroke = 2 5/8 = 2.625 Bore = 2 3/4 = 2.75

$$3.14 \times 2.75^2 \times 2.625 / 4 = 62.31 / 4 = 15.57 \text{ cu. in.}$$

2. After having checked the cylinder displacement and determined that the engine is compatible, complete the following maintenance checks to ensure that the engine is ready to be put into service.

a. Locate the specifications from the service manual for the following:

Armature air gap .008 - .012 Spark plug gap .030

b. Using the gap tool provided, what is the actual measurement of the spark plug? .020

Is the gap within tolerance for this model? no

3. Using the digital multimeter provided, does continuity exist between the legs on the armature? yes _____

a. How did you make this determination? Set the switch to the continuity setting and listened for the audible signal

Criterion	Points Possible	Points Earned
Calculations	9	
Questions	18 (2 points each)	
Safety	3	