

Name: _____ Contestant Number: _____ School: _____

**University of Wyoming “Cowboy Classic” Fall 2013
Agriculture Technology and Mechanical Systems Career Development Event
Machinery and Equipment Systems Activity**

Your logging operation has recently purchased a log splitter for making bundled firewood to sell as an additional source of revenue. Since this log splitter was purchased “used”, your supervisor has asked you to inspect a number of parts to determine whether or not they are in good working order. He has provided you with a list of part names and instructed you to identify these parts on the splitter to complete the preventative maintenance inspection.

Match the number, attached to a part on the log splitter, with the corresponding name.

	Part Number	Log Splitter Part Name
a.	2	Auto Return Valve
b.	4	Beam Assembly
c.	8	Engine Throttle Control
d.	5	Hydraulic Cylinder
e.	7	Hydraulic Fluid Reservoir
f.	3	Hydraulic Pressure Line
g.	10	Hydraulic Pump Assembly
h.	9	Hydraulic Return Line
i.	1	Tongue/Hitch Assembly
j.	6	Wedge

Questions:

1. What is the horsepower rating of the engine attached to the log splitter?

6.5

2. What fluid is used to power the cylinder?
 - a. 10w-40 synthetic royal purple
 - b. Universal Tractor Fluid
 - c. Hydraulic Fluid**
 - d. ATF

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3. To determine the cubic displacement of a hydraulic cylinder: Multiply the cylinder area by the length of the cylinder stroke. (Hint: cubic inches ÷ 231= gallons displacement).

Question: Determine the cubic displacement of a 3” hydraulic cylinder with a 50” stroke.

Answer

Area of a 3” cylinder = 7.065 square inches [determined using $3.14(r^2)$].

7.065 square inches x 50” = 353.25 cubic inches.

To convert to gallons, divide by 231.

$353.25 \div 231 = 1.529$ gallons displacement.

* Final answer can be rounded

4. A practical formula for determining horsepower requirements for pumps is as follows:

Gallons per minute x PSI Required ÷ 1714 = Horsepower.

Question: If a pump delivers .2 gallons per second and assuming that the required operating pressure is 1,000 PSI, what is the horsepower requirement for this pump?

Answer:

Multiply .2 x 60= 12GPM

Then, 12 GPM x 1,000 PSI = 12,000.

$12,000 \div 1714 = 7.0$ horsepower.

Therefore, it takes 7.0 horsepower to operate the pump.

Criterion	Points possible	Points earned
Parts ID	20 pts. (2 pts. ea.)	
Questions	8 pts. (2 pts. ea.)	
Safety	2 pts.	