



FLUID POWER

eSeries "GRADING SHEET":

NAME: _____
 Partner: _____
 Period: _____ Rotation: _____

MODULE GRADE: COURSE GR. _____ }
 POST TEST _____ } **MODULE AVE.=** _____

FLUID POWER "WORKSHEET" "WORKSHEET" TOTAL= _____

LAB PERFORMANCE: _____
 (If you are absent, write ABS on the line for the day you miss and discuss what you need to make up with the teacher)
LAB PERFORMANCE TOTAL= _____

Extra Credit—Discuss this with the instructor before beginning!!!

WORD SEARCH _____(5) Lesson 4 Bonus Paper Clips _____(5)
 MODULE REPORT _____(5) **MODULE NOTES** _____(0-10)
 CHALLENGES _____(5)

TOTAL EXTRA CREDIT= _____
 BONUS POINTS *** _____

FLUID POWER "WORKSHEET"

LESSON 2 -Complete the experiment at the sink then, answer the following questions (about density).
 Explain why the ping-pong ball floats and the clay ball sinks: _____

What happens to the clay "bowl" and explain why it does this: _____
 _____ (5)

LESSON2- "SURFACE TENSION EXPERIMENT". Get water and do experiment at the sink. Dry the paper clips on some paper towels before putting them back at your module.

LESSON 3- PART A: PRESSURE MEASUREMENT EXPERIMENT-Fill out the table below.

	First Time	Second Time	Third Time	Fourth Time	Fifth Time
PSI Measured with Pressure Gage					
PSI Measured with Combination Gage					

(5)

Have a discussion with the instructor on taking the hoses out before you remove them for PART B. T.I.: _____

PART B: Pressure Measurements – Explain the experiment below.

 _____ (5)

Environmental Impacts—Write notes from video clip.

E.I. Paper: _____(5)

LESSON 4-PASCAL’S LAW EXPERIMENT: Explain part A and B of the experiment below.

Explain PART A: _____

Explain Part B: _____

Give an example of something Part B is like: _____ (10)

LESSON 5-BOYLE’S LAW EXPERIMENT- Fill out the table below while doing the experiment 5)

	Trial 1	Trial 2	Trial 3	Trial 4
Amount of PSI measured				
Distance the Piston Traveled in inches				

(5)

Explain Boyle’s Law (also relate it to gas engines as seen from the internet).

T.I.: _____(10)

LESSON 6- Impacts of Gas Volume Change

Impacts Paper: _____(5)

LESSON 7- “Flow Meters Experiment. Show and explain to the teacher.

_____ (10)

“**STUDY GUIDE**”- Turn in the

Study Guide: _____(5)

LESSON 8- “PUMPS AND COMPRESSORS EXPERIMENT”- Explain the **WHY!!!!** (What is happening in each valve), Show and explain to the teacher.

T.I.: _____(10)

LESSON 9-”PRESSURE CONTROL VALVE EXPERIMENT”

Show **Relief/Sequence valve** set to 20 psi to the teacher.

T.I.: _____(5)

=====

LESSON 10-”ACTUATOR EXPERIMENT PART A AND PART B”

Part A: As you pushed (and pulled) on the Double Acting Cylinder (to move the Single Acting Cylinder), what happens to the Single Acting Cylinder: _____

Part B: As you pushed on the Single Acting Cylinder (**several times**), what happens to the Double Acting Cylinder: _____

LESSON 11-FORCE MULTIPLICATION EXPERIMENT- (See the next page)

Which cylinder is harder to push on: _____.

Explain why: _____

_____ . (5)

LESSON 12-"VOLUME RELATIONSHIPS EXPERIMENT".

PART A: Press on the syringe and have your partner "**help**" the Double Acting Cylinder move by pulling on it **slightly** (because sometimes it sticks and needs help to get started). Doing this will help you get the results you need for the table below. **Record** the distance both cylinders move. Put the distance in the table on the next page. **Try** the experiment a second and third time. Record the distances **each** time and put them in Test 1, Test 2 and Test 3 below.

	Distance the Syringe Moves	Distance the Double Acting Cylinder Moves
Test 1		
Test 2		
Test 3		

Explain Part A of the experiment below:

_____ . (Total=5)

PART B: Put both cylinders back in the middle. Press on the **Double Acting Cylinder**. Record the distance both cylinders move and put the distance in the table below. Try the experiment a second time and record the distances.

	Distance the Double Acting Cylinder Moves	Distance the Syringe Moves
Test 1		
Test 2		
Test 3		

Explain Part B of this lesson below:

_____ .(Total=5)

Compare Part A & B: what can you say about the "RELATIONSHIP" and the size of the cylinder?

_____ . (5)

Career Guidance Report-Write your report in your Journal.

C.G. JOURNAL: ____ (10)

Worksheet Total: _____



Fluid Power Study Guide for Post Test

1. The cross-sectional area of an object is the _____ of the object.
outside inside surface largest
2. One of the most common forces is _____, an attraction that all objects in the universe have for each other.
gravity force sync equilibrium
3. _____ states that the force that pushes up is equal to the weight of the fluid that is being moved out of the way.
Bernoulli's principle Archimedes' principle Pascal's law Gay-Lussac's law
4. _____ is the force that pushes up on an object when the object is immersed in a fluid.
Pneumatics Pressure Gravity Buoyancy
5. When a pressure is compared to an atmosphere, it is called _____.
air pressure absolute pressure gauge pressure humidity
6. Pressure that is compared to a vacuum is called _____.
air pressure absolute pressure gauge pressure humidity
7. A _____ system is a system that will not allow the fluid to escape.
sealed closed penal secure
8. _____ states that pressure in a closed system acts equally in all directions and at right angles to the vessel that contains it.
Archimedes' Principle Boyle's Law Pascal's Law Newton's Theory
9. A decrease in volume in a piston-cylinder combination is accompanied by an increase in _____.
gas volume pressure liquid
10. Boyle's Law states that if a gas is held at a constant _____, then the pressure of a gas is inversely proportional to the volume of the gas.
amount pressure temperature area
11. Pressure 1 times Volume 1 = Pressure 2 times Volume 2 is the formula for _____.
Gay-Lussac's Law Boyle's Law Combined Gas Law Pascal's Law
12. If a gas is held at a constant volume, then the pressure of the gas is directly related to the temperature of the gas.
Gay-Lussac's Law Boyle's Law Combined Gas Law Pascal's Law
13. _____ are used in both hydraulic and pneumatic systems.
Liquid Ball-and-gravity devices Pressure gauges Bourdon tubes
14. Pressure that is measured below atmospheric pressure is called a _____.
combination gauge vacuum pressure suction Both b and c are correct.
15. A _____ adds momentum to a fluid.
positive displacement pump dynamic pump compressor
Bourdon tube

16. Pumps and compressors convert _____ energy into fluid energy.
solar electrical mechanical All of the above are correct.

17. A positive displacement pump pumps a specific amount of _____ each time it goes through a cycle.
volume blood air pressure

18. _____ valves ensure that the pressure of the fluid system does not exceed the maximum pressure allowable in the system.
Pressure-reducing Safety relief Pressure Regulator

19. A check valve is used to _____ the flow of fluid in a circuit.
stop restrict monitor speed up

20. The most common type of actuator is a _____.
regulator system piston spring

21. An actuator is a device which converts fluid energy into _____ energy.
mechanical chemical kinetic electrical

22. Fluid systems can be used to change the amount of force applied to an output device. This is done by varying the _____ of the pistons.
speed quantity area manufacturer

23. The way to determine the volume of a piston in mathematical terms is:
Pressure x Area Length x Width Bore Area x Stroke None of the above is correct.

24. _____ consist(s) of a trade-off between force and distance.
Work Pressure Volume relationships Energy conservation

25. If the applied force is increased and the value of work remains the same, then the distance that force is applied _____.
increases decreases remains constant fluctuates

Fluid Power

Study Guide V6.0

Circle the correct answers to these questions as you come upon them during your next seven lessons. This study guide can then be used as a resource for your final test!

1. The study of liquid fluid power systems is known as (INTRODUCTION).
Aquatics -- Pneumatics -- Hydraulics -- Buoyancy
2. Pressure is defined as (1- PRESSURE).
area minus force -- force times area -- force divided by area -- area plus force
3. (1- FORCE) is the push or pull on an object in any direction.
pressure - weight - force - mass
4. Gravity is a(n) (1- FORCE) that all objects in the universe have for each other.
repulsion -- attraction -- illusion -- dependency
5. The force of the (1- FORCE) pulling down on you is your weight .
atmosphere – Earth’s gravity – Earth’s rotation – Earth’s orbit
6. (1- AREA) is the measurement of the surface of an object.
area - volume - pressure - circumference
7. The cross-sectional area of an object is the (1- AREA) area of the object.
outside –inside --perpendicular -- parallel
8. A fluid is a (1- PRESSURE) or a liquid. *solid - plasma - gas - force*
9. Pressure is often measured in psi, which stands for (1- PRESSURE).
pressure service interval - pounds per square inch - pressure squared invert - pressure sensitivity index
10. A liquid, usually oil, is use to transmit forces in a (1- REVIEW).
Pneumatic - Static - Hydraulic - Magnetic
11. (1- REVIEW) systems use a gas, usually compressed air, to transmit forces.
Pneumatic - Static - Hydraulic - Magnetic
12. Many tools, such as drills and nail guns, are operated (1- REVIEW).
pneumatically - magnetically - hydraulically - statically
13. Large construction machines, such as backhoes, use (1- REVIEW) systems to move heavy loads.
pneumatic - magnetic - hydraulic - static
14. (2- MEASURING PRESSURE- HOT WORD) pressure is the pressure exerted on us by the earth's atmosphere.
Systolic -- Atmospheric -- Diastolic -- Anabolic
15. Pressure that is compared to a vacuum is (2- MEASURING PRESSURE).
Gage pressure - Absolute pressure - Vacuum pressure - Atmospheric pressure

16. In many fluid power systems, a cylinder controls the movement of the (2- PRESSURE MEASUREMENT EXPERIMENT- PART B) inside of it.
valve -- gage -- piston -- gear
17. (2- MEASURING PRESSURE) pressure is pressure that is compared to the atmosphere.
vacuum - absolute - standard - gauge
18. Which object is more likely to float because of buoyancy? (3- BUOYANCY).
a basketball - a baseball - a hockey puck - a bowling ball
19. (3- BUOYANCY) is defined as mass divided by volume.
Circumference -- Density -- Pressure -- Area
20. (3- BUOYANCY) is the force that pushes up on an object when the object is immersed in a fluid.
gravity - vacuum - mass - buoyancy
21. Archimedes' principle states that the force that pushes up on an object in a fluid is (3- BUOYANCY) the weight of the fluid that is being displaced by the object.
more than - less than - equal to - different from
22. A(n) (4- SURFACE TENSION) Which of the following would be more likely to float on the surface of a fluid due to surface tension?
an empty cup -- a sewing needle -- a bowling ball -- a cruise ship
23. Pascal's law states that pressure in a closed system acts equally in all directions and at right angles to the (5- PASCAL'S LAW).
vessel that contains it -- atmosphere -- pressure constant
24. One of the most common applications of Pascal's law is the (5- PASCAL'S LAW) in a car.
electrical system - air conditioner - transmission - braking system
25. (5- REVIEW) are often used to carry fluids from one part of a fluid system to another.
Tubing and piping - Rigid canisters - Porous materials - Wood and brick
26. According to Boyle's law, if you pull back on the piston inside a cylinder to increase the volume, the pressure inside the cylinder will (6- BOYLE'S LAW).
decrease - increase - stay the same - multiply geometrically
27. An example of Charles's law would be the expansion of a hot-air balloon as the temperature (7- CHARLES' LAW AND GAY-LUSSAC'S LAW).
decreases - increases - stays the same - balances out
28. According to Gay-Lussac's law, a pressure cooker will have a(n) (7- CHARLES' LAW AND GAY-LUSSAC'S LAW) pressure when heated. **decrease in - increase in - constant - balanced**
29. The (7- CHARLES' LAW AND GAY-LUSSAC'S LAW) law relates pressure, volume, and temperature all at the same time.
constant gas law - universal gas law - perfect gas law - ideal gas law
30. Many elements such as hydrogen, oxygen, nitrogen, and carbon dioxide are (7- REVIEW).
liquids - solids - gases - plasmas

FLUID POWER

B	S	R	L	W	V	B	U	R	E	A	Y	D	F	T
G	G	C	A	A	R	P	E	D	T	O	C	C	O	E
M	R	L	I	A	C	D	E	M	S	Q	N	R	R	N
P	L	A	K	T	N	S	O	C	A	S	A	O	C	S
U	U	E	V	I	A	S	A	U	G	I	Y	Q	E	I
R	S	X	L	I	P	M	U	P	G	K	U	I	W	O
C	U	Y	R	H	T	Q	U	Q	U	E	O	E	H	N
N	C	H	E	V	L	Y	X	E	Q	S	B	H	E	A
V	R	R	D	I	U	Q	I	L	N	B	E	M	C	N
Y	I	P	R	E	S	S	U	R	E	P	U	J	A	O
C	V	A	C	U	U	M	B	A	O	L	U	F	V	T
E	G	A	G	K	S	L	R	O	O	E	I	P	K	S
O	J	M	U	N	H	E	G	V	Y	C	B	D	E	I
S	C	I	L	U	A	R	D	Y	H	L	T	U	N	P
I	L	Q	Z	Y	Y	P	C	R	U	C	E	M	T	G

AREA
ATMOSPHERIC
BOUYANCY
BOYLE
BRAKES
CYLINDER
FORCE

GAGE
GAS
GRAVITY
HYDRAULICS
LAW
LIQUID
PASCAL

PISTON
PNEUMATICS
PRESSURE
TENSION
TUBE
VACUUM
VOLUME