



FLUID POWER

v5.0 "GRADING SHEET":

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

MODULE GRADE: WORKBOOK _____
 POST TEST _____

MODULE AVERAGE= _____

FLIGHT SIMULATION "WORKSHEET"

WORKSHEET TOTAL= _____

DAILY 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)	CHALLENGES _____(5)
MODULE REPORT _____(5)	Lesson 4 Bonus Paper Clips _____(5)
MODULE NOTES _____(0-10)	
TOTAL EXTRA CREDIT= _____	
BONUS POINTS *** _____	

FLUID POWER "WORKSHEET"

LESSON 2- Have a discussion with the instructor on taking the hoses out before you do it. T.I.: _____(5)

PART A: PRESSURE MEASUREMENT EXPERIMENT-Fill out the table below. (5pts.)

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

PART B: Pressure Measurements – Explain the experiment below.

LESSON 3 -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)

LESSON 4- 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.

Environmental Impacts—Write notes from video clip. E.I. Paper: _____(5)

LESSON 5-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 6-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				

Explain Boyle's Law (also relate it to gas engines as seen from the internet. The web page is written on the note posted to the monitor. Be sure you know why the spark plug ignites the fuel and air mixture when it has been compressed to high pressure). T.I.: _____(10)

LESSON 7-

Career Guidance Report-Write your report in your Journal. C.G. JOURNAL: _____(10)

"STUDY GUIDE"- Turn in the Study Guide: _____(5)

TAKE THE POST TEST AFTER LESSON 7. THEN GO TO LESSON 8 & 9.

LESSON 8- PUMPS AND COMPRESSORS EXPERIMENT- Explain the experiment below.

_____.(10)

LESSON 9-PRESSURE CONTROL VALVE EXPERIMENT

Show **Relief/Sequence valve** set to 20 psi to the teacher. T.I.: _____(5)

Comprehensive Level- The following lessons **must** be completed to receive **full credit** at this module. Go to the "Course Menu" screen, click on Fluid Power Comprehensive Level, then click on Lesson 8 "Actuators". You will need to take the pre-test. Since you won't be taking the Post Test, just answer any answer and don't read the questions. Then do the following lessons.

LESSON 8-ACTUATOR EXPERIMENT PART A AND PART B

Define Actuator: _____.

Examples of Actuators: _____.

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: _____.

Is this an example of a Single Acting Cylinder or a Double Acting Cylinder? (circle one of the two).

Give an example of what this system is like: _____.

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

Is this an example of a Single Acting Cylinder or a Double Acting Cylinder? (circle one of the two).

Give an example of what this system is like: _____.(5)

(Get the second page of the worksheet to answer the questions for lesson 9 & 10).

LESSON 9-FORCE MULTIPLICATION EXPERIMENT-

Which cylinder is harder to push on: _____.

Explain why: _____

_____. (5)

LESSON 10-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:

_____ . (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:

_____ .

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

_____ . (5)

Worksheet Total: _____

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 - gage
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