

**APE Hydraulic test questions**

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**Question #1**

**There are two types of actuators in hydraulics.**

Name them:

**Question #2**

**How much gpm the pump delivers determines the motor speed.**

True or false?

**Question #3**

**A directional control valve does what?**

Stops, starts flow.

Stops, and direct flows only.

Start, stops, and controls flow direction.

**Question #4**

**One cubic foot of oil weighs about what?**

62.4 Lbs.

55-58 Lbs.

One pound.

**Question #5**

**Pumps pump flow and pressure.**

True or false.

**Question #6**

**Increasing the relief valve setting will give more power.**

True or false.

**Question #7**

**Using smaller lines between the power unit and vibro will do what?**

Increase the flow speed and make the vibro spin faster and save hose weight and costs.

Increase the flow speed causing more friction and less pressure to run the vibro.

**Question #8**

**What is the best troubleshooting skill needed to find hydraulic problems?**

Have the right tools.

Knowing the equipment.

Able to read hydraulic schematics.

**Question #9**

**APE reservoirs are designed to clean themselves once a year.**

True or false?

**Question #10**

**APE power units require special hydraulic fluid.**

Yes

No

Can use any good grade hydraulic fluids.

**Question #11**

**You can look at any hydraulic fluid and tell if it is bad, dirty.**

Sure you can see the dirt.

Only if you let the sample settle for one hour.

No, we filter below what the eye can see.

**Question #12**

**APE power units do not use filters.**

That is true, they simply will not hold up in such a demanding application like pile driving.

APE power units use return filters, plus off-line filtration to keep the fluid clean..

**Question #13**

**Increasing the relief valve setting will do what?**

Operating pressure will increase, load.

No affect on operating pressure, load.

Increase the pump gpm.

**Question #14**

**APE power units use piston pumps, not gear pumps which are cheaper?**

True or false

**Question #15**

**You can replace the vibro hydraulic motor with any motor that will fit the flange, this is the great thing about APE units.**

Yes APE designed their vibros to use any hydraulic motor.

No that is not true.

**Question #16**

**The eccentrics in the vibro actually turn the hydraulic motor when at full speed.**

True or false?

**Question #17**

**Any APE power unit will run any vibro in the fleet.**

Again, all APE units are designed to do this.

No, each power unit is designed to run specific models of vibros.

**Question #18**

**To check the condition of APE hydraulic pumps, just stick a pressure gauge into the quick disconnect, if you read 4500 psi, the pumps are good.**

True or false?

**Questions #19**

**When testing an APE hydraulic hammer, the engine speed should be set to what?**

No really important, just over idle about 1200-1300 rpm.

Always test at 1500 engine rpm.

Full engine governed speed.

**Question #20**

**All APE power units are factory set for hydraulic pressures and never need adjusting.**

That is true all are set by factory, they will never change.

No pressure settings can change each day depending on the air temperatures, and must be set each day before driving.

Yes, pressure setting can be wrong or changed, each unit must be set or checked before leaving the APE yard for job site.

**Question #21**

**To check a hydraulic pump, what do you need?**

Pressure gauge.

Flow meter and pressure gauge.

Hydraulic schematic and pressure gauge.

**Question #22**

**What is the most important thing about hydraulic fluid?**

Buy the top brand.  
Pour fluid through red rag to keep dirt out of tank.  
Shake fluid barrel before pouring into tank to mix additives.  
Keep it clean and water free.

**Question #23**

**You can tell if your are driving hard or easy by looking at the drive pressure gauge.**

That is silly, you will see the same pressure regardless of driving conditions.  
A high pressure reading means easy driving.  
A low pressure reading means less amplitude on vibro, very easy driving.  
Higher pressure, harder driving, lower pressure, easy driving.

**Question #24**

**This is a trick question, so read it carefully.**

The speed of a vibro depends on the gpm and size (displacement) of the vibro motor.  
The torque of a vibro depends on the pressure and size (displacement) of the vibro motor.  
Nether of these statements are true.  
The first statement is true but the other is false.  
The first statement is false but the other is true.  
Both statements are true.  
Both statements are false.  
I have no clue to the answer.

**Question #25**

**This is a hard question, think about this for awhile.**

What is the MOST harmful to the hydraulic fluid? Rate them from worst =1 to least =5  
Dirt.  
Water.  
High oil temperatures.  
Low oil temperatures.  
Wrong fluid type.

**Question #26**

**Be careful how you answer this question.**

I have gone through the APE hydraulic course.  
I did not go through the APE hydraulic course.  
Only skipped around, less than ten minutes.  
Studied it for over an hour.

**Question #27**

**When the vibro is switched off:**

The motors on the vibro turn into pumps, the motor inlet side will draw fluid from the motor outlet side until motors stop.  
The motors stopped instantly due to power unit brake valve.  
Motors spin to a stop from reverse flow from the power unit main hydraulic manifold.

**Question #27**

**The clamp pressure switch is set:**

300 psi above the main relief valve.  
300 psi below the clamp main relief valve.  
At the same exact pressure as the main relief valve.

**Question #28**

**The clamp relief valve setting can be quickly known by:**

With the engine running, and the hoses disconnected, turn the switch to "open" and hold switch while reading the "open gauge"  
Turn clamp switch to "closed" and read the "clamp closed gauge".  
Read the clamp open gauge after the jaws are closed.

**Question #29**

**The drive pressure relief valve setting is known by:**

Removing quick disconnects, start engine and set at 2000 rpm, turn switch on the pendant to "drive forward" and read the drive pressure gauge while free hanging the vibro or drill.

Put a gauge in the drive side disconnect and read the gauge after you turn the switch to drive forward.

**Question #30**

**The pop off valve on the vibro or drill will open and spray oil everywhere if: Answer each question true or false.**

The case drain line is not hooked up to the power unit.

The power unit is substantially higher in elevation than the vibro, such as if the power unit is on a bridge and the vibro is down.

The hydraulic oil is too cold in the case drain line and it cannot flow back to tank without building up pressure that is higher than the pop off valve setting.

There is a kink in the case drain line hose or someone has parked their truck on the hose bundle.

The hose bundle is looped too far up the crane boom causing higher case drain line pressure due to moving oil up the hose.

The motors on the vibro or drill are worn out and have excessive leakage into the case drain line, causing the return line pressure to increase.

The hoses on the vibro or drill were disconnected while fluid was hot and the fluid expands, causing the oil pressure to increase.

to increase blow over the pop off valve.

The case drain line quick disconnect is faulty or has junk caught in it, restricting or blocking the flow to tank.

The case drain line is too small in diameter.

The pop off valve has lost its o-ring due to popping off earlier.

The pop off valve setting adjusting screw has backed off causing the valve to open at lower than desired pressure.

**Question #31**

**When looking at the gear pump on an APE unit how do you determine the size of the gear?**

**Question #32**

**How many cubic inches does a #10 gear put out per rotation? Same question for a #12 and a #15?**

**Question #33**

**How do you determine the gear ratio on any vibratory pile driver?**

**Question #34**

**One can change the torque of the motor by changing the cubic inches of said motor. Do I add or subtract cubic inches?**

**Question #35**

**My gearbox is filled with hydraulic oil. How did this happen?**

**Question #36**

**How do I convert cubic centimeters to cubic inches?**

**Question #37**

**How do I convert gallons per minute to cubic inches?**

**Question #39**

**If I have four #10 gears how many cubic inches per revolution can I get?**

**Question #40**

**If I have four #12 gears how many cubic inches per revolution can I get.**

**Question #41**

**If I have four #15 gears how many cubic inches per revolution can I get.**

**Question #42**

**If I have two #10's and two #15's then how many cubic inches do I get in one revolution?**

**Question #43**

**If I have a 3.6 cubic inch gear what number is it? What flow does it have per revolution? Same questions for a 4.5 gear.**