

Only Via Trailer #217
San Luis Obispo, Calif.



Mr. & Mrs. Ted Reaner
Route 1, Box 188
Watsonville,
California

June 23, 1948

Dear Mother, Dad & the Boys,

We received your card and letter this week, Mother, and also the shipments.

The weather has been wonderful for about a week now so Cus has had plenty of fresh air. I put him outside in his buggy in the morning, usually about 11:30 and it was pretty hard to find a shady spot for him so Bob fixed a shade for him out of heavy canvas-like cloth. It is usually a little too windy in the afternoon when there's plenty of shade.

Bob was baptised last Saturday afternoon at 1:30. Of course, Cus and I went along to watch. Fr. Carrabin baptised him. Now both Bob and I can go to Communion Sunday.

We took Cus to Mass with us last Sunday but when it was about three-fourths over he started to grunt, groan and skrim so we had to take him out - that is Bob took him out to the car. I guess we'll have to start going to different masses so that one of us can stay home with him.

We decided that we would rather get a separate gift for Bill & Vera so hope it's okay with you. We won't be able to go to the wedding mainly because Cress has a heat rash and the ride up there wouldn't do it any good. It gets so hot in the car with the sun shining through the windshield and the heat from the engine coming in. Then, too, Bob would miss quite a few hours of school.

Cress has been real good yesterday and today. He's usually fussy some time of the day but you have to expect that.

It's time I get dinner ready so will close for this time.

Ship certainly did well at his life saving tests.

Love,

Dad, Bob & Cress.

I saw the airplane yesterday and was surely surprised at the work the kids have done on it since I last saw it. They have the wheels on it now, the instrument panel nearly finished, gas tank in, and I could list a whole page of things they've done. It really looks swell.

I'm enclosing a test that Bob had - before he took he thought he didn't know anything about hydraulics.

1. What is the approximate efficiency range of an aircraft hydraulic system?

70% to 92%

2. Does the viscosity of an hydraulic oil increase or decrease with an increase in temperature?

decreases

3. In general the work done by a piston may be calculated by the average force times the distance through which the piston travels. (T) F

4. The load supported by a piston is equal to the hydraulic pressure times the piston area neglecting friction. (T) F

5. (a) Check valves are desirable in a simple reciprocating pump system. (T) F

(b) Why? When the piston is drawn back, the outlet check valve closes to prevent fluid from coming back into the cylinder and the inlet check valve opens to allow fluid to come in. When the piston is moved forward the inlet valve closes and the outlet valve opens.

6. Name two types of check valves.

1. ball type

2. swing-gate type. or Flapper

7. Name two popular types of hydraulic cylinder packings.

1. chevron

2. ~~oderine~~

(C)

O-Ring

8. State the equation for horsepower as used in hydraulic control systems.

$$HP = \frac{(\text{Hydraulic pressure } \#/\text{in}^2) \times (\text{in}^2 \text{ of piston area}) \times (\text{Piston travel in feet})}{550} \times (\text{Time in seconds})$$

9. Do aircraft brakes systems always require a master pressure cylinder for each wheel?

No

(a) Can you name an airplane type having only one master cylinder? SBDU (Navy)

(b) And by what method is the differential pressure between the wheels for each wheel handled.

Rudder pedals.

10. Name 3 types of aircraft brakes by the method of applying friction to the axle assembly.

1. Expander Tube

2. Multiple Disc

3. Brake Shoe

11. Can mineral oils be added to a hydraulic system containing rubber packings or seals?

No.

(a) If not why? Mineral base oils affect rubber.

12. In an air oil shock strut (a) the metering pin is not tapered on the outside; (b) the main landing impact is taken by oil; (c) taxi loads are taken by the air.

(a) F

(b) T

(c) T

13. Draw a sketch of 3 types of aircraft packings.

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No such plane.
It made it up

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13. (cont)

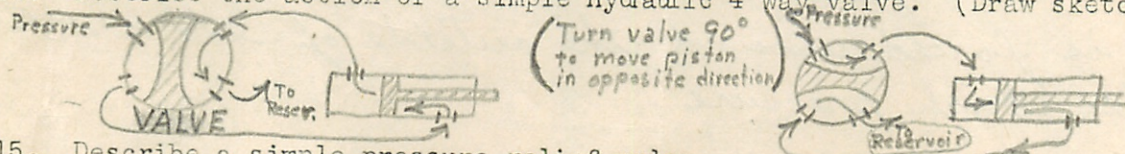
Sea Ring
(John Mansville)

Chevron
(Garlock)

O-RING

Cross Sections.

14. Describe the action of a simple hydraulic 4 way valve. (Draw sketch if necessary)



15. Describe a simple pressure relief valve.

A spring loaded valve that moves off of its seat at a certain pressure and opens up a passage to the reservoir or some low pressure part of the system.

(a) What is its purpose in the system? Its purpose is to prevent the pressure in the system from getting too great.

16. Describe gear type hydraulic pump and its action. See back of page.

(a) What is its purpose in the system? To provide pressure for the system.

17. Describe pressure accumulator and its action. May be of piston or diaphragm type. It has an air side and oil side. Oil builds up pressure and compresses the air.

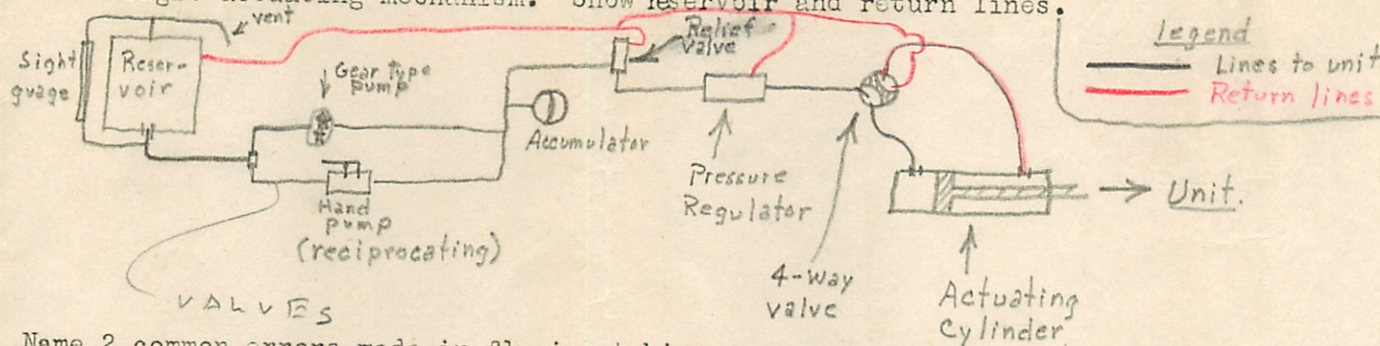
(a) What is its purpose in the system?

It is a storage place for energy or pressure.

18. Describe hydraulic pressure regulating valve. This valve regulates the pressure. It kicks out when the pressure gets too high and kicks back in when pressure gets too low.

(a) What is its purpose in the system? To keep the pressure within a certain range.

19. Draw a sketch showing the items you think should be included in a simple aircraft hydraulic system beginning with engine pump and running through the system to a single actuating mechanism. Show reservoir and return lines.



20. Name 2 common errors made in flaring tubing.

Wrong size of flare

1. (ie. too much or not enough flare) 2. Flaring crooked, or wrong angle.

21. Give the equation for the ultimate bursting pressure for hydraulic tubing.

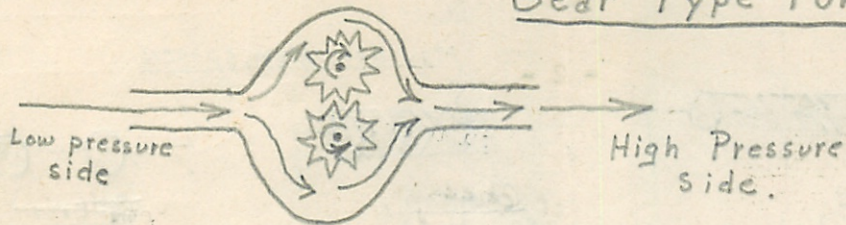
$$\text{Bursting pressure} = P = \frac{2TS}{D}$$

where: T = wall thickness

S = $\frac{1}{4}$ tensile strength.

D = Outside Diam. of tubing.

Gear Type Pump



The fluid cannot go between the gears but is forced around the outside of the gears under high pressure.