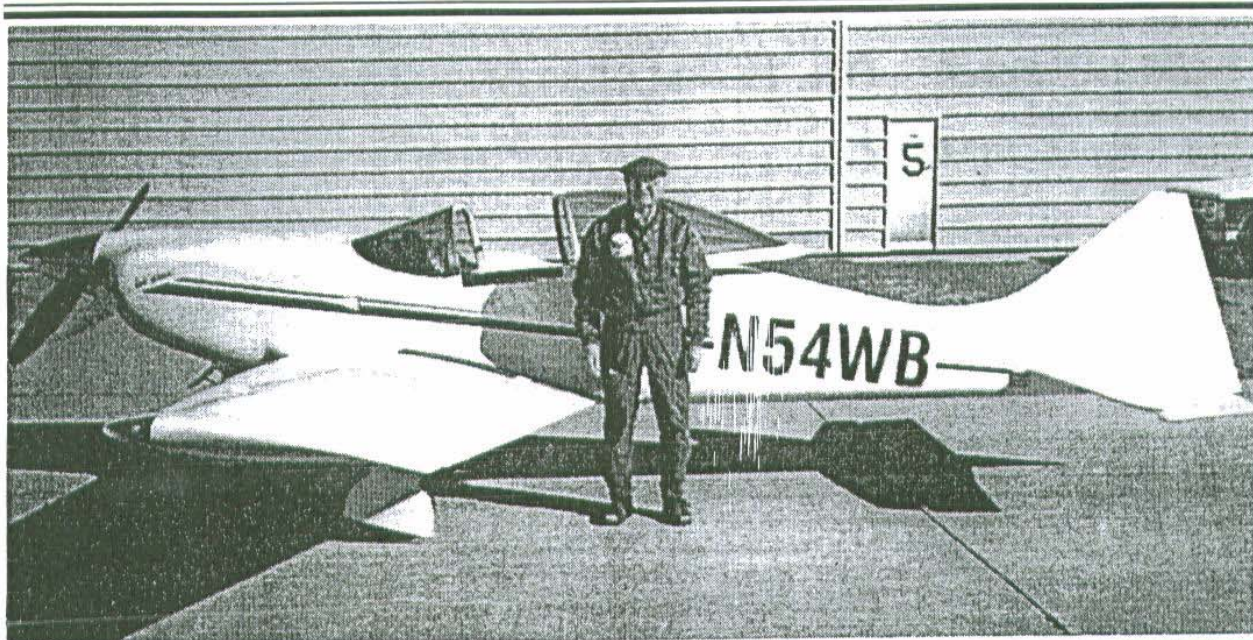


BUILDERS & FLYERS GP4 NEWSLETTER

THE OFFICIAL VOICE OF GP-4 BUILDERS ALL OVER THE WORLD

VOLUME 14

MAY - JUNE 1997



BILL BERRICK OF OMAHA, NEBRASKA MAKES HIS FIRST FLIGHT IN HIS GP-4!

Dear Spud,

It flew!! On March 26th I flew my GP-4 for the first time, (intentionally), and it handled beautifully. I had flown about nine hours the week or two before in an original Yankee to get used to going down final at 90 MPH and dropping out of the sky below 78 MPH to prepare for the test flying. I also flew a Bonanza a couple of times, including a "dress rehearsal" the morning

of the first flight, and I can say the GP-4 felt much more like the Bonanza than the Yankee. It was responsive to the controls but not at all twitchy.

I left the gear down and stayed in the pattern to check out the engine and controls and everything functioned as advertised. Except for the climb-out, I was at 18" MP and 2400 RPM for 120 MPH. I didn't go higher to try to determine the stall

speeds, (expected to be about 65-70 MPH), so used 100 MPH down final on the approach. It felt fine on the controls with full flaps so I slowed to 90 getting near the field. The touchdown looked fine on video for about a 10-15 knot quartering wind from the right—touched right wheel first then the other two, bounced about two feet in the air, a second bounce, then roll-out.

On the video, after the second

bounce, rolling out with the wings level, you can see the left main gear come up about half way!! As it slowed down, the tail lowered and started dragging on the metal tiedown ring, then the left wing lowered with the drag pulling me off of the left side of the runway onto the turf—but with the prop well clear of the ground!

The threaded rod end, (AN490HT11P), that is part of the left retract link had broken, letting the left gear retract until the gear door impacted on the remaining part of the retract link so that the airplane was riding on the lower edge of the foam-fiberglass gear door, the tail tiedown, and the tip of the left elevator. Damage would have been minimal if I hadn't encountered a runway light that made three small, (3"), rounded skin breaks in the under-surface of the wing and a big 8" x 10" hole in the outboard end of the flap.

The good news is that it flew well, didn't ding the prop, and had no real structural damage. The better news is that I have been flying it again the past ten days, (until stopped by cold rainy weather), without further difficulty. I've flown it two more times with the gear down and once with it retracted. I had scarf-patched the skin damage and replaced the threaded rod ends with the 3/8" size, (AN490HT14P). This made it necessary to also change to the larger size Uniball bearing, (MW-6), and to use a bronze bushing to make it fit on the 5/16" stud of the main gear leg. It makes a sturdier looking retract link—looks like the plans drawing, (which measures 3/8" on the threaded part).

As is usual in any unfortunate incident, a hard look revealed a sequence of events, and some things that could have been done differently by a smarter builder/pilot and with the benefit of hind-sight.

A week before this event I was doing some fast taxiing and had a

friend parked along the runway to watch for any fluttering of the spring-loaded internal gear doors. He parked in a good place to observe other things and I decided to also try to determine the lift-off speed to use to calculate expected best climb and glide speeds. I gave it full throttle and watched the speed go through 60 and 65 MPH, then watched outside and felt it lift off—I thought about a few inches or foot in the air. Rather than twisting the throttle back, I pushed the release button and pulled it right back to idle to abort although I had plenty of runway, 4100 feet. It dropped like a rock, left wing low! The observer said I was actually six to ten feet in the air! That was indeed a **HARD** landing.

I taxied on in and put it on the jack to inspect for damage. The threaded rod end on the right gear retract link appeared to be bent so I ordered two of the rod ends. Then for whatever reason I changed out the right rod end but not the left because I could see no damage to it, even though I knew it had hit left gear first. I'm sure that was when the damage was done and the stage was set for the next landing because the threaded rod broke just inside of the jam nut.

● Lessons learned:

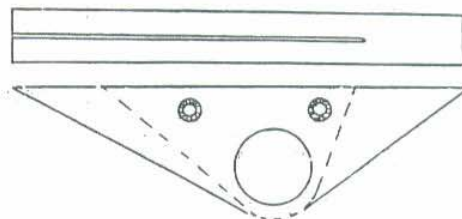
- 1) Don't fool around with fast taxiing—lots of people advise that it is more dangerous than taking off and flying. (I had already taxied fast enough to make it get light on its feet and start to drift sideways in a cross wind on an earlier day, so this effort didn't really prove anything!)
- 2) Very few reasons to ever immediately pull the throttle back to idle.
- 3)

If you order two replacement parts, use them! You can probably suggest a few more lessons from this adventure.

After the "intentional" flight on the 26th I was twisting back on the throttle as I was flaring, but I didn't "hold it off" to get slowed down enough from that fast approach speed. It may have been just as well to get the failure over then and there at the home airport because that was not the first time I have bounced on landing, and this airplane will need to withstand two foot bounces occasionally in the future. I might have stayed on the runway if I had used a little right brake, but as long as that prop was staying out of the concrete I don't think I wanted to do anything except sit there shutting things off and otherwise being a passenger once it let the wing down.

I had filed the retract link to go slightly over center rather than attaching the spring as George suggested in the Newsletter, volume 12. Having it over center helps to lock it in place but would also put some side stress on the threaded part that would not be present with the straight through design shown on the plans. Anyway, I think I demonstrated the "weak link in the link", and you might want to consider going to the 3/8" rod end. I don't believe in beefing up everything on the airplane until it is too heavy to fly, but this change added minimal weight.

I also added another 2 oz. by making a tail skid out of 3/4" nylon to fit over the sheet metal tie down point on the tail truss, (see drawing). It fits against the tail cone and is retained by two 10-32 machine screws. The tie down point is less than two feet off of the runway at



NYLON TAIL SKID

neip when I am being sure to touch down on the mains rather than the nose wheel.

The landings on the subsequent flights have gone well using 90 MPH on final, slowing to 80 when "over the fence", and probably touching down at about 70, (I was busy looking outside, not at the airspeed). It's a good airplane and I'm looking forward to fair weather and more test flying.

Regards, Bill Berrick
11803 Hunters Cove
Omaha, NE 68123-1119
Home Phone (402)292-6832
E-mail: berrick@worldnet.att.net

Super congratuations Bill for an incredible accomplishment! - Spud

GEORGE'S CORNER



Fellow GP-4 builders,

Spud has sent me a bunch of questions emitting from builders as their GP-4's progress.

Some I can answer as follows:

● Band saw blades:

I keep 3/8" wide skip tooth blade on my saw for all of my cutting. It cuts a little more rough than the finer blades, but will cut aluminum very well with out a speed

and tail ribs staple two pieces of ply together and saw two ribs at a time for a left and right side. Saw on the outside of the line, then sand up to the line for both ribs on your table disk sander.

● Wood Adhesive:

I prefer T-88 epoxy to any wood glue that I have used to date. Always apply glue to each side of the joint. Do not use a lot of clamp pressure (with epoxies) or you will squeeze the glue out causing a dry joint. If you see a void in your fuselage side take a hack saw blade and saw into the void to clean out the T-88, then fill with fresh T-88 and floc (ground up cotton) and press into the saw cut with a putty knife. The T-88 and the floc are mixed into a fairly thick compound so it will stay in the joint void. If your shop is cold keep your T-88 in a box with a 40 watt light bulb. This will keep your glue viscous and easy to mix and spread.

● Laminating the spar caps:

Some of this is covered in the plans and the construction manual, but lets have a little refresher course!

Lay out all of the lumber for each spar cap. If the vertical grain is slanting one way, reverse the slant on the next lamination. Mark each board in a sequence of how they are to be laminated. Those boards that require a scarf to lengthen the cap should be glued and dry prior to final lamination. Remember you have to laminate the complete spar cap all at one time so get some help to spread the glue and bolt up the laminating clamps shown on drawing #17. I strongly recommend a dry run for bolt up prior to final lamination. Time it to insure you have enough time to complete the final job before the glue sets up. A cool morning will give you more time when using these epoxies. I used FPL16A in my spar in my spar, but

If you sand a board for a glue joint, be sure to remove any sanding dust prior to spreading the glue. Hold the board upside down and rap it, then wipe it down. Blow it off if you have air.

● Welding:

Which is best, gas (acetylene) or TIG (inert gas)? I'm a pretty good gas welder so I like acetylene. Those nice pretty beads you see that Darry does in TIG or what some people call Heliarc. The acetylene generally uses more rod or a larger bead in the weld joint. My theory is that the larger bead tends to fillet and spread out the load providing you have full penetration. If your welding heavy wall tubing the TIG can penetrate better. Some of these TIG welders boast they can weld a beer can to a railroad iron. That's after a lot of beer however! Its important to stress relieve a large cluster weld regardless of a gas or TIG weld. You do this by heating the welded cluster to a dark cherry red and back the torch off slowly for a slow cooling period.

Incidentally if you where heating up those copper spark plug washers to anneal them you must quench them in water to soften them. Just the opposite of steel. Steel, when heated and quenched in oil or water, gets brittle or harder! Don't hold the welded component under the faucet so you can hold it. Let it cool slowly.

● What ever happened to the GP-5?

The GP-5 history is not at all germane to GP-4 construction, but since the design caused some flurry of interest in the air racing community several of you have asked about it.

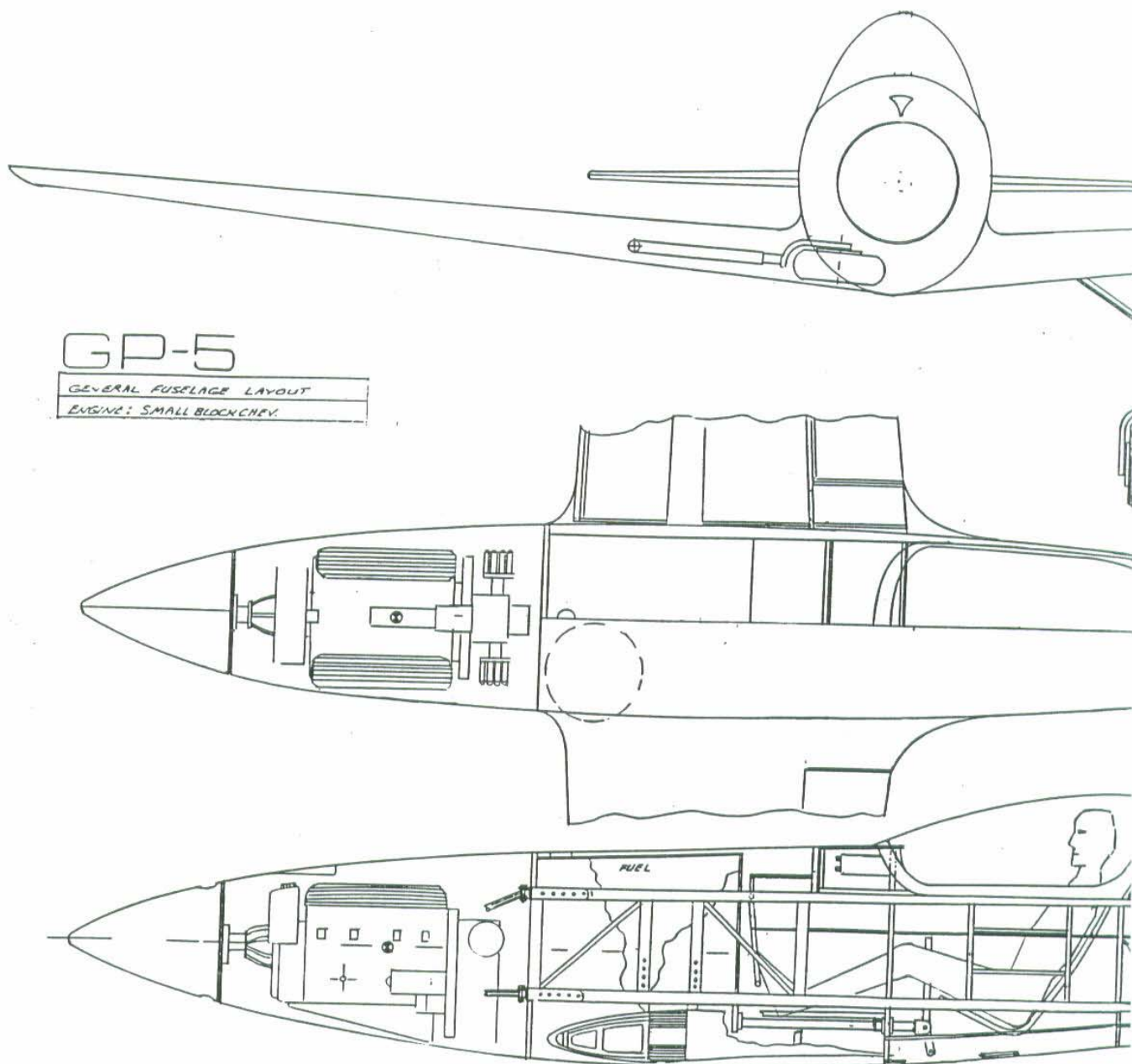
The GP-5 is an unlimited racer, designed by me, built by Gary Childs and partially financed by Mike Pinketh. Mike was an American Airlines captain and a competitive aerobatic pilot. He was to do the test work as well as race the aircraft. Mike lost both hands in an auto race which stopped the project. The

GP-5 airframe was almost completed and most of the engine parts were finished or the design work completed. Gary has since sold the project. The outcome is uncertain. The new owner says he intends to complete it and race it, but I won't

hold my breath! The sad story does have some good news. Mike Pinketh is back competing in aerobatics with two artificial electric hands. *A Very Gusty Guy!*

The fuel injected engines require an auxiliary fuel pump with a 15 to 25 psi. These vane type pumps generally are 15 volt electrical units. The store bought airplanes use a Dukes auxiliary pump that sell for about

● Auxiliary fuel pumps:



\$500.00. If you buy a used one its very expensive to rebuild it. Also no one will sell you the rebuild parts. Liability again bows its ugly head. Don't despair, Darry Capps found a 12 vane type automotive pump that he says works just fine.

It's a Holley, part number #12-802. Its about the same size as my Dukes and sells for around the \$100.00 area. Mike Traud just bought one from a hot rod/speed shop for his GP-4. Darry mounted his Holley

pump horizontal on the bottom side of the pilots floor board just in front of the fuel valve. It is then plumbed forward, still under the ply floor, through the firewall for engine hook up. You should plumb the pump with a bypass valve so the engine driven pump can pump around the auxiliary pump when the auxiliary pump is off. If the vanes fail and blocks the flow, the bypass will allow the engine driven pump to supply fuel to the engine. If you use the Holley, ask for the high pressure spring that you can install that raises the pressure from 15 psi to 19 psi.. It also has 3/8" NPT female inlets and outlets so you will need reducers from 3/8" NPT male to 1/4" NPT female. I have made a drawing showing the bypass and AN fittings for installation.

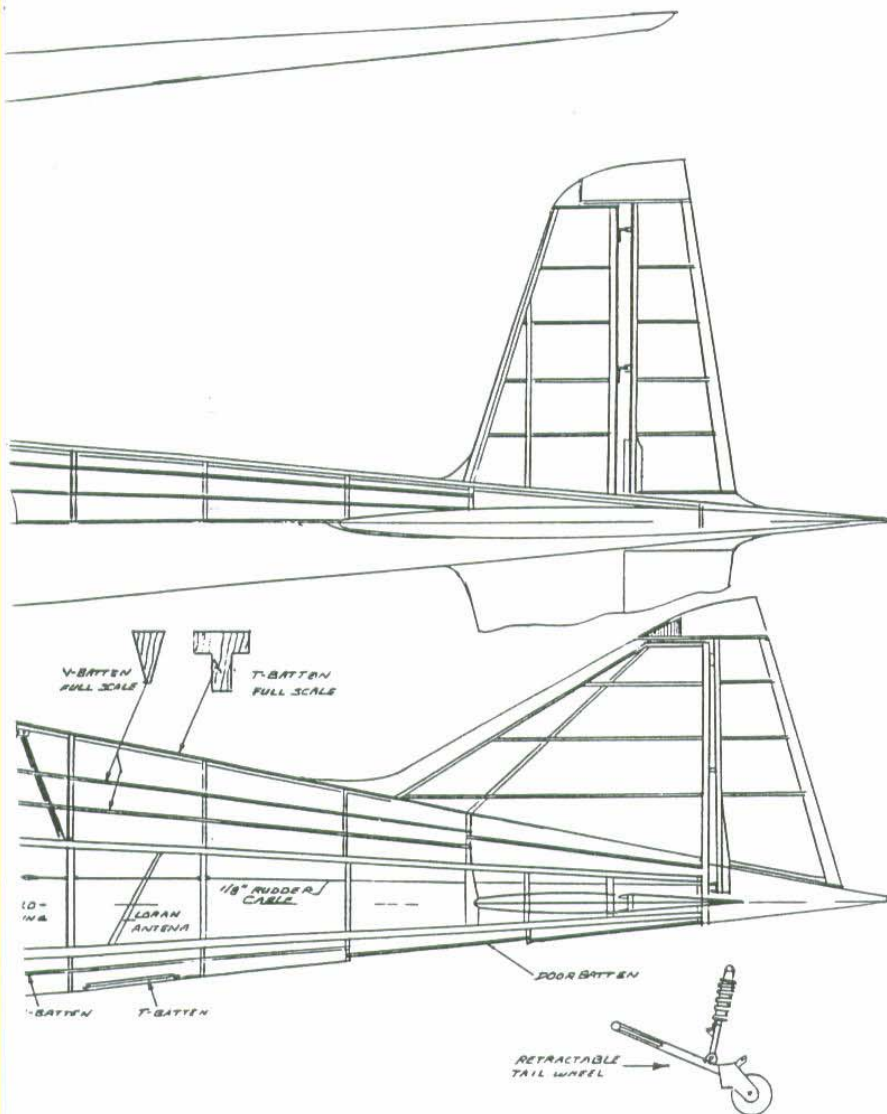
Regards, George

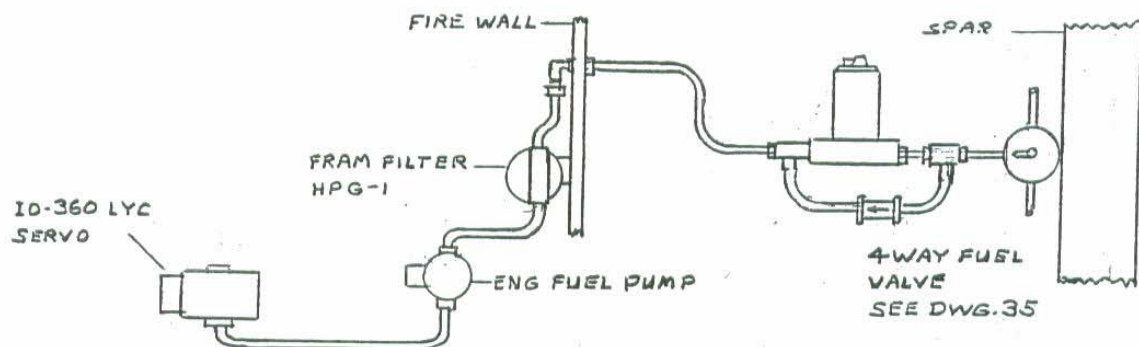
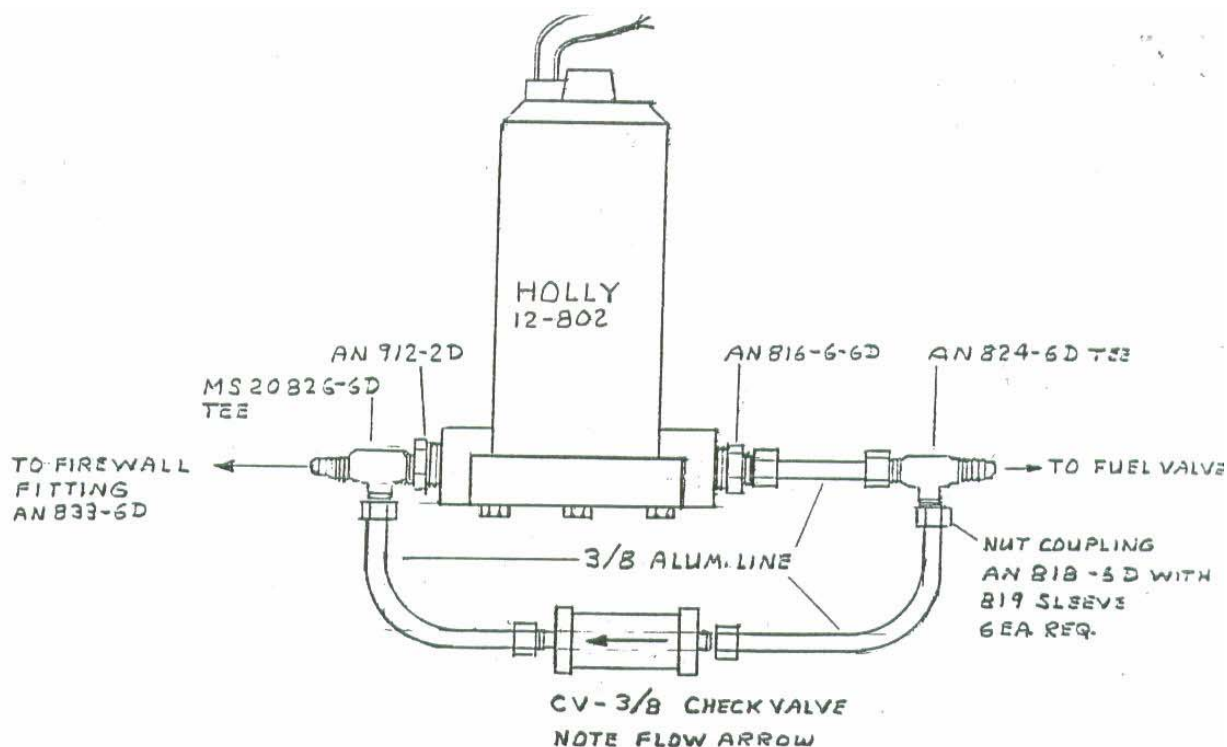


MORE ON THE AUX. FUEL PUMP

Here's an area I can contribute a little on and that is the fuel pump that George spoke of in this issue. I've been in the racing industry for 25 years and the Holley pump that George is talking about as been around almost as long as I can remember. One thing I want to point out is that we sell 100's & 100's of these pumps every year and the returns because of some type of defect is absolutely minimal. This will be a very dependable pump. The part number for the pump is 12-802 and it automatically comes with an adjustable fuel regulator. How the racers use it is to have the pump in the back by the gas tank or fuel cell. The pump is set at the higher pressure through the fuel system and the regulator is right before the carburetor where they then drop the pressure back down to 5 to 7 1/2 psi. Do not use this regulator! The next thing that is

Continued on page 7





THE HOLLY 12-802 HAS A MOUNTING BRACKET NOT SHOWN HERE. IT CAN MOUNT HORIZONTAL UNDER THE PILOT'S SIDE FLOOR IN FRONT OF THE FUEL VALVE. AN ACCESS PANEL IN THE BOTTOM SKIN MUST BE INSTALLED. IT SHOULD BE A FLUSH FIT ABOUT 6" WIDE X 9" LONG. LARGE ENOUGH FOR PUMP REMOVAL. THE HOLLY 12-802 REQUIRES A SMALL SPRING INSTALLED TO RAISE FUEL PRESSURE TO 19 PSI. ASK FOR THIS SPRING WHEN PURCHASING PUMP FROM AUTO SPEED SHOP.

GP-4

"More on Aux. Pumps"

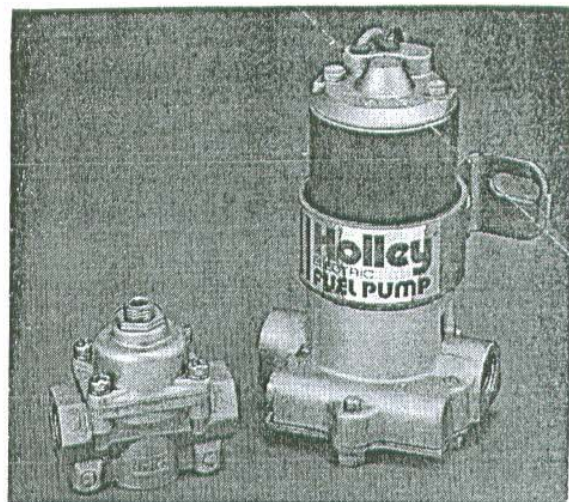
Continued from page 5

nice about this pump is that it is completely serviceable. Service items include gaskets, filter screens, impeller vanes, impeller cavity, motor brushes and so on.

The high pressure boost spring that George talked about to raise the pressure up to 19-20 lbs is made by Moroso and the part number for that is #65770.

I don't think you'll find the pump

at you neighborhood parts store, but if you have a speed shop in the area you shouldn't have any problem. If any of you folks can't seem to find access to these two items. I'll be glad to supply them to you. The Holley #12-802 pump would run \$105.00 and the Moroso fuel pressure spring #65770 is \$4.00. and figure \$10.00 for postage. Mail me a check and I'll get it out to you in a week. Make your checks payable Bill Spornitz. Any questions give me a call in the evenings (913) 397-0518. - Spud Spornitz



THE CLASSIFIEDS

For Sale: Pre-fabricated composite components for GP-4. Cowling - \$750.00, exhaust blisters - \$110.00, inlet ramps - \$110.00, tailcone - \$105.00. Complete four pieces package for \$1000.00 and \$75.00 shipping charges Jake Jackson - Rio Linda, CA (916) 992-0608

For Sale: Quality custom fabricated metal components for your GP-4. See GP4BFN issue #4 for complete component listings and pricing. Please allow generous time allowances for your orders. Darry Capps, 813 Hoyer Road, Newman, California (209) 862-2707

For Sale: We have all of the GP-4 back issues (1996 and back) available for \$3.00 each. Mail your checks to Bill Spornitz - 1112 East Layton Drive - Olathe, KS 6061-2936



Subscribers Information Center

GP-4 Builders & Flyers Newsletter (GP4BFN) is currently published Bimonthly at a rate of \$3.00 per issue/\$18.00 a year in U.S. \$3.33 per issue/\$20.00 a yr. in Canada, Alaska & Mexico. \$4.83 per issue/\$29.00 a yr. (U.S. funds) per 6 issues to foreign subscribers. Send remittance to: GP4BFN, 1112 Layton Drive, Olathe, Kansas 66061. **PLEASE MAKE CHECKS PAYABLE TO: BILL SPORNITZ**

Ideas and opinions expressed in GP4BFN are solely those of the individual submitter. This information is for educational purposes only! Application of these ideas and/or suggestions contained in GP4BFN are the sole responsibility of the experimental aircraft builder at their own risk, which could result in builder/pilot personal injury or death. GP4BFN, George Pereira, Osprey Aircraft do not imply or suggest in any way their usage.

Letters, Pictures and computer supplied data submitted to GP4BFN are subject to final screening by GP4BFN / Bill "Spud" Spornitz and may be restricted, deleted or revised. Material returned by request only.

Classified advertising; (non-commercial) for current subscribers may place an ad of 50 words or less for \$6.00 per issue, with one photo an additional \$14.00. Back issues of "GP-4 Builders & Flyers Newsletter", back issues are available for \$3.00 each.

The use of "Lycoming", "Hartzell" and/or "Osprey Aircraft" by GP4BFN is for the sole purpose of application and description only and is not intended to infer or imply a direct connection between GP4BFN, Lycoming, Hartzell or Osprey Aircraft.

913-764-5118

E-MAIL BSPORNITZ@AOL.COM

Oshkosh 1997 Attendees

There will be a GP-4 builders meeting at 9:00 to 11:00 AM Sunday morning, August 3rd at the Homebuilders Headquarters building. The building is just located south east of the tower. They have a front and back porch. The meeting is on the front porch (the runway side). Everyone is welcome, bring you photo's, questions and answers for this two hour get together. See everone there - Spud



1112 EAST LAYTON DRIVE
OLATHE, KANSAS 66061

FIRST CLASS MAIL

NEWS FOR CRAFTSMEN OF FAST WOODEN AIRCRAFT!