

August 2006
GP4BFN51

News for builders of fast wooden aircraft!



Lynn Sheets's
Awesome
GP-4
At Oshkosh 2006



HYDRAULIC GEAR PLANS NOW AVAILABLE

The prototype GP-4 uses a manual landing gear retraction system. After numerous repeated requests from builders, George developed an electric hydraulic gear for the GP-4.

The advantages of the

hydraulic system are obvious, flip a switch and fly the airplane. The disadvantages include extra weight, possible electric/hydraulic failure, a back-up system, and maybe some more expense.

No machine work is required for any of the components. Plans are available for \$150 from Osprey Aircraft. You can find the address and an order form on the website and on the last page of this newsletter.

GEORGE'S CORNER

BY GEORGE PEREIRA



Fellow GP-4 Builders:

The fact that there are two types of retractable gear available for the GP-4 sometimes presents a dilemma for new plan holders. It's often the question; should I go hydraulic or stick with the manual system? I will try to give you my best analysis of the two systems and the genesis behind each design.

When I designed the manual system for the GP-4, I had used it successfully on the Osprey 2. I was also influenced by a 1966 Mooney that I purchased in 1967. I had to muscle the Mooney gear to get it up, but the absence of motors and hydraulics was appealing.

...the absence of motors and hydraulics was appealing.

The GP-4 gear geometry shown on drawing #33 (top left) seems

simple enough, however the addition of augmenting springs, air driven up-locks, and door linkage adds complexity as the design evolved. It does work well and has been trouble free for the past 900 hours.

If your memory is working, the manual system is fail safe. The FAA does not require any emergency back up in a manual system. If only linkage works the gear up and down, they equate it the same as any control system.

One of the peculiarities of the GP-4 manual system is the faster you go, the more muscle it takes to retract. This is due to the shape of the main gear doors. They form a low pressure area on the curved outer surface. I have flown the GP-4 without the doors and the gear retracts as easily as when the plane is setting on jacks. Speeds much over 105 mph inhibits gear retraction.

The GP-4 gets off about 90 mph and accelerates rapidly. Once you learn the throw of the retract handle it is easy to retract the

gear before you get to 100 mph.

I suggest on first flights to leave the gear down until you are at traffic altitude, then slow to 100 mph and get comfortable flying at the lower air speed. Now you can retract the gear. Keep doing this until the throw becomes easier, and there is no bobble from any control response during retraction.

Remember, if you don't get the gear up on the first try after lift off, leave it alone and just fly the airplane. When you're at a safe altitude slow up and retract at a safe airspeed. When carrying a passenger, be sure there is no clothing or body parts covering the retract receptacle. I once punched a hole through my passenger's leather coat. His four letter expletive still rings in my ears.

The gear handle doesn't take up much room once stowed in the gear up position. In the down position, it sets about four inches in front of the avionics. To get the radio out of the tray, you have to retract. This is no big deal but it pays to have some custom jack stands for your annuals.

I designed the hydraulic gear for the GP-4 because several builders had asked for an alternate retraction system. A local GP-4 builder, Jake Jackson, had involved my good friend Ralph Hallenborg in retrofitting a hydraulic gear in his almost finished GP-4. Between the three of us we got a hydraulic

GEORGE'S CORNER

gear set up that has served Jake well over the years.

I was looking for a design much less complex than Jake's hydraulic gear. I wanted something that didn't require expensive machine work, and could use available hydraulic components. It took me a year to research plus a couple of working mock ups to get what I wanted.

Number one, it had to be builder fabrication friendly.

Number two, it needed fail safe up-locks so the hydraulics could be shut down.

Number three, it had to have an emergency gear down release, exclusive of electric or hydraulic power. This is also a requirement from the FAA on experimental aircraft.

The hydraulic gear spaces the main gear one inch further outboard. This allows the GP-4 to set a little more tail high since the gear legs are extended one

inch. Anyone starting to build who has not made up his mind on which set up he wants, has to make these modifications before he gets too far.

The nose gear tunnel has additional mount blocks over the manual gear. The main gear is moved outboard one inch, so all of the gear mount plates are in a different location.

As for the cost, the hydraulic gear will cost more. The three hydraulic cylinders will cost around \$150 each. The pump motor is about \$400. You have a bunch of hoses to make up, so I recommend you buy a mandrel and make up your hoses. The hydraulic gear eliminates the retracting push rods and the complex gear handle, walking beam component.

The advantage of the hydraulics is obvious. Flip a switch and fly the plane. The manual system works OK and will save you a few bucks. Weight wise, I estimate the hydraulics will cost you about six pounds.

If you have further questions, give me a call.

Regards to all,

George



BUILDER'S RESOURCE

BY BOB FOSTER

Many GP-4 builders who have completed their fuselage have installed Jim Weir's antenna kit. Jim has many more "can't live without" electronic designs that will save you beaucoup bucks or as he says, "A champagne panel on a beer budget." He has published a full panels' worth of designs in Kitplanes for several years, from about 1996 to present. I have listed all the publications and subject that I have, perhaps someone else could fill in the blanks

Kitplanes Magazine

- Jan 97, pg 87, Coaxial cable
- Mar 97, pg 69, Extending landing light life
- May 97, pg 72, ELT antenna
- July 97, pg 79, Wire rack
- Oct 97, pg 62, Radio Connectors
- Feb 98, g 86, Radio "stuff"
- Apr 98, pg 20, Altitude chamber
- June 98, pg 86, Auto Am FM Radio
- Oct 98, pg 60, Inexpensive intercom (I missed most of 1999 & 2000)
- Dec 99, pg 115, VHF nav antenna
- Oct 00, pg 49, LED position lights
- Nov 00, pg 65, GPS
- Jan 01, pg 88, Dim Bulbs
- Feb 01, pg 61, Antennas
- Apr 01, pg 61, lamp dimmer
- Aug 01, pg 68, Aviation software
- Feb 02, pg 43, Engine monitor
- Apr 02, pg 79, Battery sulfate buster

FLYING THE GP-4

By Mike Traud

In Part One of this series we discussed what it is like to fly a GP-4. In fact, there was no discussion on takeoffs or landings, we simply started out at altitude and got an idea as to how this aircraft performs. In this part we'll discuss what it takes to get a GP-4 to altitude, i.e., preflight, taxi, takeoff and climb.

As with any aircraft, the flight starts with a thorough preflight inspection. What follows below is *one example* of a typical GP-4 Preflight Inspection Checklist. Please keep in mind the fact that your aircraft may and probably will be different. Take a look at the checklist and then we'll discuss some of the finer points.

GP-4 PRE-FLIGHT INSPECTION CHECKLIST

Magneto/Starter Switch – OFF
 Master Switch – ON
 Gear Indicator Lights – Down (Green) Indication
 Position/Nav/Strobe Lights – Check
 Fuel Quantity (Center and Main Tanks) – Check

Walkaround Inspection

- Left Static Port – Unobstructed
- Left Fuselage – No damage, check canopy for free movement
- Left Elevator – No damage, free movement
- Tail Tiedown – Release
- Rudder – No damage
- Right Elevator – No damage, free movement



Mike Traud preparing to take John Reinhart up for a familiarization flight in Darry Capps' GP-4, s/n 1. Mike is an 11,500 hour pilot with Master Flight Instructor and FAA Pilot Examiner designations. He has over 200 hours in GP-4's having flown several and has performed numerous checkouts of pilots in the GP-4. He can be reached at traud@hotmail.com

Right Fuselage – No damage, check canopy for free movement
 Right Static Port – Unobstructed

Right Wing and Control Surface Skins – No damage
 Right Flap and Aileron Attachment Points – Check
 Right Aileron – Check, free movement
 Right Nav/Strobe Light – Check

Right Fuel Tank Vent – Unobstructed
 Pitot Tube – Remove cover, unobstructed
 Right Fuel Tank – Check fuel quantity, fuel cap secure
 Right Landing Gear and Doors – Check (no damage, brake pad wear, brake assembly (leaks), remove chocks)
 Right Wing Tiedown – Release
 Right Fuel Tank Sump Drain – Drain, check for contaminants

nants

Header Tank Sump Drain – Drain, check for contaminants
 Engine – 6 quarts minimum for flight
 Right Cowl Fasteners – Check for security and none missing
 Oil Cooler Louvers – Check, unobstructed
 Nose Gear – Check condition (strut, doors, linkage), remove chock
 Air Inlet – Remove cover, unobstructed
 Alternator Belt – Check
 Cowl Inlet Ramps – Unobstructed
 Left Cowl Fasteners – Check for security and none missing
 Fuel Filter Sump Drain – Drain, check for contaminants
 Left Wing Sump Drain – Drain, check for contaminants
 Left Wing Tiedown – Release

FLYING THE GP-4

Left Landing Gear and Doors -
 Check (no damage, brake
 pad wear, brake assembly
 (leaks), remove chocks)
 Left Fuel Tank - Check fuel
 quantity, fuel cap secure
 Left Fuel Tank Vent – Unob-
 structed
 Left Nav/Strobe Light – Check
 Left Aileron – Check, free
 movement
 Left Flap and Aileron Attach
 Points – Check
 Left Wing and Control Surface
 Skins – No Damage
 Master Switch—Off

As you can see from the above Preflight Inspection Checklist, the procedure is straight forward. Some particular details regarding the GP-4 to pay attention to are the gear doors (inadvertently extending the gear above the design extension speed could result in stress on the doors – *ref. GP4BFN 48; August 2005; page 3* for a review of GP-4 speed limitations); the canopy latch mechanism (you want this checked for firm, positive latching); the cowl fasteners (some tend to loosen up

over time where upon they should be replaced); the engine cooling inlets (the engine on the GP-4 is very tightly cowled – you don't want any obstructions such as birds, debris, etc. as this would be a serious impediment to cooling and a fire hazard).

When you are looking up into the gear wells, check the attach points of gear to make sure they are absolutely snug and no evidence of movement or “play” exists. Check over the weldments on the gear trusses, over center struts, rod end bearings, etc. looking for cracks in welds and the overall condition of the structure. (Several GP-4's have experienced gear “failures” due to excessive side loads during crosswind landings or simply not keeping the machine straight when touching down. A few of these type landings and something typically lets go and you've crunched your airplane. (Bummer.) Over time, as the

aircraft ages, you may notice some cracks or blemishes in paint (especially around faring areas and locations where flexing occurs in the structure). While these are typically of no concern (except in the appearance area), they should be kept track of and investigated further if the crack or blemish increases in size.

After a thorough preflight inspection, its time to get in and start it up. (Do you have the required fuel load for the intended flight?) I'm not going to tell you how to get into the GP-4 – it is somewhat small and requires a bit of flexing. (The procedure to assist an attractive female into the GP-4 cockpit, while very complex, can add to the overall enjoyment of the flying experience. Be sure to assist her first, then you get in.)

Once you are secure in the saddle, take a minute or two to relax and look around the cockpit. In most cases, the plane your sitting in is the one you built and as such, it should fit like a glove. George Pereira designed the cockpit and instrument panel layout using very conventional, tried and true methods so the familiarity of it all should be very comfortable. Make sure your passenger (if applicable) is settled in with seat belt/shoulder harness fastened and comfortable. Explain the procedure to unlatch the canopy (should that be required), the use of the headset and that they are going



FLYING THE GP-4

flying in an experimental aircraft. Now lets run the Before Starting Checklist:

BEFORE STARTING CHECKLIST

Preflight Inspection – Complete
 Fuel Quantity – Check, Center Tank, Left and Right Main Tanks
 ELT – Armed
 Seat Belt/Shoulder Harness – Secure left and right
 Fuel Selector – Center Tank for takeoff
 Parking Brake – Off
 Magneto/Electronic Ignition / Starter Switch – Off
 Master Switch – Off
 Alternator Switch - Off
 Alternate Air Door – Pull to open
 Mixture – Idle/Cutoff
 Propeller – Forward
 Throttle – Closed
 Panel Switches – Off
 Circuit Breakers – Check
 Passenger Briefing – Complete

As with the Preflight Inspection Checklist above, the Before Starting Checklist is provided as an example and may not fit the requirements for you aircraft. It should be noted at this juncture the fuel selector design in the GP-4. George's design incorporates a four (4) position (Off, Left, Center, Right) fuel selector. Because the center fuel tank is above the wing tanks in terms height above the mean center of the airframe, it has gravity feed characteristics. Selecting the center tank for takeoff provides and added safety margin in case

of and engine driven or electric boost pump failure during take-off.

The discussion below for engine starting deals with the Lycoming IO-360 series engines. These are four cylinder, horizontally opposed, aircooled, direct drive 200 horse power engines and are built-proof in their design. The 360 series is a perfect match for the GP-4 and provides an abundance of performance that leaves the competition in your mirrors. The following checklists are typical for engine starting of the IO-360 series:

ENGINE START CHECKLIST – COLD ENGINE

Seat Belts/Shoulder Harness – Secure left and right

Brakes – Set
 Circuit Breakers – Check
 Throttle – 1/8 to 1/4 inch open
 Propeller – Forward
 Mixture – Idle cutoff
 Master Switch – On
 Beacon/Nav Lights – On, as required
 Auxiliary Fuel Pump – On
 Mixture – Advance to full rich until fuel flow registers (usually 3 seconds), then idle cutoff
 Auxiliary Fuel Pump – Off
 Propeller – Clear area
 Starter – Engage, as engine starts, advance Mixture to full rich
 Throttle – 1000 RPM
 Oil Pressure – Rising to 60 PSI
 Fuel Pressure – Check 10 –15 PSI
 Suction – 4.8 to 5.2 in Hg
 Alternator – On
 Ammeter – Charge indication
 Avionics Master Switch – On
 Trim – Set for takeoff



3 headed for Oshkosh

FLYING THE GP-4

ENGINE START CHECKLIST – HOT ENGINE

Seat Belts/Shoulder Harness – Secure left and right

Brakes – Set

Circuit Breakers – Check

Throttle – 1/8 to 1/4 inch open

Propeller – Forward

Mixture – Full rich

Master Switch – On

Beacon/Nav Lights – On, as required

Auxiliary Fuel Pump – Off

Propeller – Clear area

Starter – Engage

Throttle – 1000 RPM

Oil Pressure – Rising to 60 PSI

Fuel Pressure – Check 10 – 15 PSI

Suction – 4.8 to 5.2 in Hg

Alternator – On

Ammeter – Charge indication

Avionics Master Switch – On

Trim – Set for takeoff

The above checklists are identical for the start procedures except that for a hot engine, the initial priming (utilizing the auxiliary fuel pump) is omitted and the mixture control is set to the full rich position. These procedures are fairly standard for Lycoming fuel injected engines utilizing two magnetos. Some engine installations may have electronic ignition on one side and a standard magneto on the other. Typically, starting these engines is identical, except that you usually start the engine on the magneto and once the engine is run-

ning, switch on the electronic ignition. (If you have dual electronic ignition installation, follow the prescribed procedure from the manufacturer for engine starting.) Occasionally, an engine may become flooded during the start procedure. The following checklist addresses a flooded engine:

FLOODED EN- GINE, CLEAR AND START CHECKLIST

Mixture – Idle cutoff

Throttle – Full open

Propeller – Clear

Starter – Engage and count six propeller blades of rotation, then starter disengage

Wait – 1 to 2 minutes

Throttle – 1/8 inch open

Mixture – Idle cutoff

Starter – Engage, as engine starts ad-

vance Mixture to full rich

Throttle – 1000 RPM

Oil Pressure – Rising to 60 PSI

Fuel Pressure – Check 10 – 15 PSI

Suction – 4.8 to 5.2 in Hg

Alternator – On

Ammeter – Charge indication

Avionics Master Switch – On

Trim – Set for takeoff

The above procedure should be repeated if the engine does not start. You may have to turn on the auxiliary fuel pump and advance the mixture for 1 second to re-prime the engine. It is important to emphasize here that the above procedures are for standard IO-360 installations. Many GP-4's have fairly standard engine installations, however there usually exists minor differences such as electronic ignition. These differences are taken into account with variations in the above engine starting checklists.



George and Pat Salamone

FLYING THE GP-4

As the engine settles in and all parameters are within limits (i.e. the green arc on temperatures and pressures), you are ready to taxi for takeoff. Take a minute or two to run a Before Taxi Checklist:

BEFORE TAXI CHECKLIST

Radios – Tune to appropriate ATIS, ASOS, AWOS frequency (if available) for current airport conditions

Transponder – Standby

Beacon/Nav/Strobe Lights – As required

Navigation Systems – Set

Altimeter – Set

With regards to navigation systems, this is where several differences between cockpit layouts exists among GP-4s. Before taxiing, ensure your particular system is set for the intended flight (i.e. directional gyro – set to magnetic compass; GPS system – on and integrity checked, flight plan loaded, etc.). Check the brakes as you initiate the taxi and make sure you have an airport diagram out if you're even the slightest bit unfamiliar with the airport. (It is always a good idea to have the airport diagram out either way....)

As you taxi the GP-4, you'll notice that it has very good ground handling characteristics. Visibility forward is very good with no significant obstruction. Nose wheel steering is accomplished using the rudder pedals and is

nicely responsive. On hot days, you will want the canopy open. The GP-4 canopy design is such that the canopy is prone to slide shut due to the 11 degree slope of the canopy base. To solve this problem, I have installed a "canopy friction" device which utilizes a threaded knob with a pad on the lower side which, when turned to a certain point, contacts the canopy base and slows or stops the sliding action of the canopy. (Refer to *GP4BFN 49, January 2006* for some ideas on completing your canopy such as the friction knob.) As you approach the run-up area, be aware of other aircraft in the same area and be sure to note which way you are pointing (generally into the wind) so the propeller blast doesn't piss any body off. Also be aware of your strobe lights during night operations. Now lets run the Before Takeoff Checklist:

BEFORE TAKE-OFF CHECK-LIST

Brakes – Set

Fuel Selector – Center Tank, recheck quantity for intended flight

Auxiliary Fuel Pump – Off

Flight Controls – Check, free and correct

Flight Instruments – Check

Radios and Navigation Equipment – Check and set for departure

Alternate Air Door – Pull to open

Trim – Set for takeoff

Mixture – Full rich

Throttle – 1900 RPM

Magneto(s) – Check, no more than 175 RPM drop

Propeller – Cycle three times noting RPM drop, manifold pressure rise, oil pressure drop

Suction – Check

Throttle – 1000 RPM

Canopy – Closed and confirmed positively latched

Seat Belts/Shoulder Harness – Secure left and right



Always draws a crowd

FLYING THE GP-4

Transponder – On/Alt

Auxiliary Fuel Pump – On

During the run-up procedure, pay particular attention to the magneto check. If a drop of more than 175 RPM occurs, plug fouling may be the culprit or possibly faulty wiring. In some cases, you may have to return to the hangar for further investigation.

Now the fun begins. You are ready for takeoff. Since GP-4s can be built with either a manual gear system or an electric/hydraulic system and since there exist many operational and flight handling differences between the two, both takeoff procedures will be discussed.

TAKEOFF CHECKLIST (NORMAL TAKEOFF)

Auxiliary Fuel Pump – Off

Alternate Air Door – Pull to open

Power - Advance Throttle SLOWLY to full and 2700 RPM

Nose Wheel Lift-Off – 60 knots (ease back on the stick – not abrupt – until aircraft becomes airborne and attains 10 degree climb attitude)

Landing Gear – Retract before 100 knots

Climb – Establish good rate of climb (at or below 110 knots) to 1000 AGL

TAKEOFF PROCEDURE WITH MANUAL GEAR SYSTEM

As with any takeoff, be sure to clear the area thoroughly before taking the runway. As you taxi onto the runway, recheck the fuel selector, canopy and take a quick look around the cockpit to ensure everything is in order.

(It's a little late if she now says she wants to get out.....). Line up on the centerline of the runway and smoothly add power, checking temps and pressures as you bring it through 2000 RPM. (Note: Avoid rapid opening of the throttle as the engine [IO-360 series] is equipped with a counterweighted crankshaft which could be subjected to detuning of the counterweights which in turn could result in damage to the engine.)

Release the brakes and note that some right rudder will be

needed to track the centerline. You may be surprised as to how much right rudder is needed here. Remember P-factor? What about spiraling slipstream? Or torque. To save you the staggering amount of time it takes to find this information in the FAA Flying Handbook, we'll go through a brief explanation of the factors which want to take you off the runway to the left. P-factor is a yawing moment or force which acts upon the aircraft as a result of the downward propeller blade taking more of a bite than the upward blade. This is because the angle of attack of the downward blade is greater than the upward blade. A nice way to see this is when a GP-4 is parked, it usually sits a little tail low. With the propeller blades horizontal, sight down the leading edge of the wing and note the bite of each propeller blade. You will notice the downward blade definitely has the bigger bite. This is what is occurring when you are careening down the runway. The large bite



FLYING THE GP-4

produces more thrust and wants to yaw the machine to the left. Right rudder keeps you straight.

Spiraling slipstream is another force that wants to yaw you towards the right. As the propeller turns, the slipstream it generates rotates in a clockwise direction around the fuselage. As it rotates clockwise, it strikes the vertical stabilizer and "pushes" the tail to the right, nose left, which requires right rudder to keep you straight. Spiraling slipstream is most pronounced during the initial takeoff roll.

Torque (or reactive torque) forces occur when either the engine tries to rotate the propeller or the propeller tries to rotate the engine. These forces are transmitted to the engine itself, the engine mount and finally the airframe. Torque forces are easily corrected with application of rudder.

As the GP-4 accelerates through 60 knots, smoothly lift the nose wheel with slight back pressure on the stick. Hold the back pressure – not abrupt – and lift-off will occur at about 70 knots. Retract the gear at or below 100 knots.

This is an area of GP-4 flight technique that deserves mention. The manual gear system design requires that you retract the gear with your right arm (assuming that you are in the left seat). This involves grabbing the gear handle, moving it down to release it from the vertical (gear extended) position lock,

and in one continuous motion, moving the gear handle through approximately 90 degrees of travel aft to the horizontal (gear retracted) position between the seats. You need a little muscle to do this.

You also need to take your right hand off the throttle to do this. And you have to maintain control of the aircraft with your left hand in the process. Remember the discussion of pitch sensitivity in Part One of this discourse? (*ref – GP4BFN 50, May 2006*). We discussed how sensitive the aircraft is especially in pitch. This is where deftness and skill come in as you don't want to inadvertently pull back on the stick during gear retraction and depart the GP-4 from controlled flight (i.e. a stalled condition).

This has occurred before in this aircraft with fatal results. It is natural for you to pull back on the stick as you are moving the gear handle aft to retract the

gear. It takes a bit of practice to get this down where you can immediately retract the gear after liftoff.

Until you are very adept at this procedure, simply climb out at 100 knots until you get to a safe altitude and then retract the gear. You will need to reduce power to keep the machine from exceeding 100 knots in order to retract the gear. The faster you go, the more difficult it is to get the gear up because of the aerodynamic loads imposed on the gear.

Be careful when you latch the gear retract handle in the horizontal (gear retracted) position as it can get hung up in you passengers clothes (i.e. jacket or sweater) or cords for head sets. If something gets in the way, you won't be able to fully retract the gear and close the inner doors via the air pump (which is enabled by the gear handle being in the full latched, horizontal



FLYING THE GP-4

position. With the gear retracted, we can now settle into the climb portion of the flight. As mentioned in the Takeoff Checklist (Normal Takeoff), it is a good idea to climb initially at (or below) 110 knots to gain altitude so that a safe return can be initiated if a problem is encountered during this phase of flight. (This is simply a safe practice in any aircraft which provides you needed altitude for maneuvering in case of engine problems or other issues which would dictate an immediate return to the airport.)

TAKEOFF PROCEDURE WITH ELECTRIC/ HYDRAULIC SYSTEM

There are some differences in the takeoff procedure with GP-4's equipped with the electric/hydraulic gear system.

Essentially, the above procedure (manual gear) is followed and the gear is retracted using the switch in the cockpit. As with the manual gear system, it is important not exceed the design retraction speed limitation of 100 knots. This could impose a load on the hydraulic system which could result in the gear not reaching the up and locked position.

Remember, the GP-4 accelerates rapidly and you'll see yourself through that 100 knot limitation before you know it. Another consideration with the electric/hydraulic system is the retraction time. This can be consid-

erably *slower* than the manual system (depending on the system pressure in your aircraft). Note: The system pressure is set by the pump manufacture and varies depending on the pump and its configuration. When ordering your gear pump, you can specify what system pressure you want. Typical hydraulic gear pressures for light aircraft range from 800 psi to as high as 1800 psi. As such, it is important to ensure all three wheels are up and locked before settling into the climb.

Now that we have the aircraft configured for the climb, we can initiate the Climb Checklist.

CLIMB CHECKLIST (NORMAL)

Throttle – 25" manifold pressure

Propeller – 2500 RPM

Mixture – Rich

Airspeed – Establish: Vy (best rate): 125 knots; Vx (best angle): 95 knots

Alternate Air Door – Close and engage ram air inlet

Auxiliary Fuel Pump – Off, note fuel pressure

Temperatures and Pressures – Monitor (Oil, Fuel, CHT)

The climb airspeeds stated in the above checklists may vary, depending on your aircraft and it's performance as determined during the test phase. They are provided here as reference speeds and may not match what you see in your GP-4. As you climb, pay attention to engine temperatures (i.e., oil temperature, fuel pressure, and CHT). If you see higher than normal temps during the climb, you may have a cooling problem.

Warmer temperatures can be



Picture provided by: Nicolas Hombreux

FLYING THE GP-4

mitigated by reducing the climb rate, enriching the fuel mixture or reducing power. In any case, you may consider returning to the airport to check into the problem. The checklist above as well as the Takeoff Checklist address the Alternate Air Door.

The GP-4 is equipped with an alternate air source which provides induction air other than that provide from the ram air inlet. This procedure is utilized on takeoff to minimize debris and FOD (Foreign Object Damage) entering the ram air inlet while on the ground.

In the next installment of this series, we will discuss the descent and landing of the GP-4. To further discuss takeoffs in the GP-4, or any other subjects, feel free to contact me at the Gold River Facility: traud@hotmail.com

THE GP-4 ROTISSERIE

By Adrian McClelland

There is a stage in building the fuselage when it needs to be turned over, on it's side, upside down, right side up again, etc..



Every time you want to do this, you have to enlist the help of someone for assistance, which can be a bit inconvenient if you

want it to happen now and you can't find an instant helper.

I decided that once the fuselage had it's top skin on, I would construct a rotisserie to support the fuselage so that I could turn it to any position I required, when I wanted and without any assistance.

By chance, I came across a couple of heavy duty tripod stands at a local sec-

ond hand dealer. These were adjustable for height.

I welded section of 1 ½" steam pipe across the top of the stands. Then I welded up a couple of frames that would clamp to the firewall and Sta.178, welded a length of pipe to them that would fit inside the steam-pipe. A couple of 7/16" nuts welded to the steampipe and a couple of bolts to fit is all that was needed to hold the fuselage in any required position.



THE GP-4 ROTISSERIE

I screwed some wood formers to the support frames that fitted inside the firewall and sta.178 voids to overcome any slippage problems.

My fuselage can now be turned with one finger. It actually works better than I anticipated.

The best part of all, the whole thing cost me about \$10.00.

Hope you guys find this useful.

Anyone with "SKYPE" can skype my as *adriansgp4* and I'll show you live on the webcam.

Adrian McClelland

Victoria

Australia





Adrian's
Rotisserie



OSHKOSH 2006 REPORT

By Adrian McClelland

I made it to Oshkosh after about 15 years. It is a bit of a trip from Australia. Bob Ringer from Canada and his son Jeff met me at O'Hare on Monday, and after waiting for 4 hours, Wayne Tomkins from OZ arrived and we all headed for Fon-Du-Lac.

Tuesday, we picked up Ray Call at Fon-Du-Lac airport and headed for Oshkosh. I won't go into all the usual Oshkosh stuff because this is really a GP4 report.

Tuesday. looking around at all the things to see, we came across Jim Simmons and his

agreed was a good number. I wish I'd written down all the names but I was a bit preoccupied with imminent arrival of the Lancaster, but Jerry is closest to the camera, Wayne behind him, Ray next, Bob and yours truly in the middle, and Lynn Sheets. To the others, I apologize for not remembering your names.

Most of the GP4 builders at the Homebuilders Center. It was a great gathering, ideas swapped, stories told. The time coincided with the arrival of the Lancaster which I really wanted to see.

If I may digress from GP4 stuff for a moment, My father did about 40 missions over

So there you have it. That was the GP4 department of Oshkosh. It was great meeting you guys, and good to catch up with Bob Ringer, who has become a close friend since his visit to Australia. You do meet fantastic people, building this aircraft.

Thanks, Jerry, for organizing the get together, and Lynn, for being so candid about your aircraft.

Finally, all I can say is support Elton and keep your articles coming in for this newsletter, and keep in touch via our new Yahoo GP4 group site.

Look forward to meeting more of you guys next time.

Cheers for now
Adrian McClelland

Australia
(more pictures next page)



Jim and his Skybolt with Bob Ringer and camera

Germany in these things as a mid-upper gunner in WW2. So I had to include a couple of photos. It's my father's 81st birthday today.

The only GP4 at Oshkosh this year was Lynn Sheets'.

Lynn has some innovative changes to his aircraft, such as "wet wing" leading edge full span fuel tanks. This means he was able to do away with the fuselage tank. He can also remove the canopy completely, which makes loading of the baggage area a lot easier.



Lancaster Arrival

Skybolt. We do love you, Jim. I hope you don't mind me mentioning you here.

Wednesday, Jerry Peck had organized a 2.00pm meeting at the homebuilders center. 10 builders attended, which we all

