Part 1112 or How to land with the gear not down

Once upon a time in a Galaxy far, far away…no, that's not it. This incident happened much closer and more recently than Star Wars. We, as Seabee owners and pilots, have had trouble with Part 1112, AKA the "H" Bracket, in the past. It's the main linkage for the landing gear retraction system. There has been more than one failure in the past, as most of you know, but more recently we had an experienced Seabee pilot (Seabee Club member John Roder) have a failure of Part 1112 IN FLIGHT! I know for a fact that this has happened at least once every decade or so and this is how his story goes:

John Roder (text): "**MAYDAY**. I m having a landing gear problem and need some help."

Other Seabee owner: Didn't answer the text as he was under his Seabee working on it.

John Roder's friend to Other Seabee owner: Please call John Roder as he his having trouble extending the landing gear.

Other Seabee owner: Still not aware of the situation. Still under the Seabee.

Finally the call came through:

John Roder: I had a total hydraulic failure and the landing gear is down about 30° and the pump handle is limp, no pressure.

Other Seabee owner: How much gas do you have?

John Roder: About an hour and a half.

Other Seabee owner: Okay, are you close to water?

John Roder: Yes. I'm over a lake right now.

Other Seabee owner: Have you considered landing on the water?

John Roder: Yes but I think the Seabee will nose over on touch down.

Other Seabee owner: Okay, do you have any hydraulic fluid in the airplane?

John Roder: No.

Other Seabee owner: Do you have any fluids at all?

John Roder: Yes, I have some oil.

Other Seabee owner: Okay, put the oil in the hydraulic reservoir.

John Roder: I can't get the filler cap off.

Other Seabee owner: Do you have a wrench?

John Roder: No. (But it was later learned that he had a pair of pliers but still no luck)

Other Seabee owner: Okay, let's see if the flaps will work. Put the landing gear handle in the neutral position; in the middle of the lever travel and try the flaps.

John Roder: Okay….(long pause)… Nothing. The hydraulic handle is limp, no pressure.

Other Seabee owner: Are you near an airport?

John Roder: Yes. There is one by the lake.

Other Seabee owner: You might consider landing in the grass at the airport. Land as slow as you can into the wind. Do you have a boat hook or rope on board?

John Roder: Yes.

(Ed note: Not knowing the severity of the situation the "Other Seabee pilot" assumed the "H" bracket (Part 1112) was intact but alas, it was not.

Other Seabee owner: You might try grabbing the gear with the boat hook or lasso it with the rope and see if you can pull it over center.

John Roder: Okay, I'll see what I can do.

Othe Seabee owner: Okay, good luck and call me when you can.

John Roder: Okay, bye.

It was a couple of hours or so before John called back and he mentioned he decided to land on the lake. He was calling around to get ideas and finally got on the phone with another very experienced Seabee pilot, Bruce Hinds. Evidently Bruce had a similar situation happen to him a few years back and landed on the water with the landing gear partially retracted. This made John's mind up at that point. It was going to be a water landing. Bruce convinced him that the water landing would be no big deal except the landing roll, if you want to call it that, would be very short with lots of splashing.

The landing was successful! John taxied to shore and beached it and began the task of trouble shooting the problem. It was a broken "H" bracket (Part 1112) and actuator fitting (see the photos below). It appears to be corroded in places and perhaps the bracket had been cracked years ago and it finally broke. When it did the bracket (Part 1112) or a part of the airframe broke off the lower fitting on the landing gear actuator, which allowed ALL the hydraulic fluid to leak into the hull. No fluid was left in the system at all. Even if he

filled the reservoir it wouldn't have helped. The only thing he could have done was put the gear handle in "neutral" and filled the reservoir with ANY fluid and may have had flaps for landing but this is just speculation.

Here is John's report:

Seabee S/N XXX: Retraction of the landing gear was attempted but the attempt failed with the main landing gear extended about 30 degrees out of down lock position. With a full tank of fuel it was hours of slow flight practice over land and water to prepare for the eventual landing as slow and controlled as possible. Eventually, convinced of hydraulic failure, I decided to do a water touchdown, believing I could get the gear to retract further with the help of the water before the final touchdown. The landing was not all that different to a land landing except for there being a bit of a fast snap to nose down as the wheels contacted water. Paying attention to the tendency to nose down on each contact, the Seabee was certainly manageable through it all with a big splash once the wheels submerged and the hull made firm contact. For suspected hydraulic failures and landing gear not locked down, I absolutely would again land on water.

Further inspection revealed a failure of the cast down lock (part 1112) that caused a secondary failure in the hydraulic fitting to the actuator (part 1149). As this is my second Seabee, I recommend checking the cast down locks for cracks as I found this new Seabee to not land the same way as the old one did. From the appearance of the part, it's probable this problem could have been prevented with closer inspection as the crack seems to have developed over time."

John did everything right. He called friends, the airport (he did have the fire trucks standing by), other seaplane pilots and took all of their advice and came up with a smart solution. He even had plenty of gas!

What did we, as Seabee pilots, learn:

1-Always carry some hydraulic fluid with you. A pint or two could make the difference between a questionable water landing or a normal airport landing. In any event, when the gear won't come down use any fluid to fill the reservoir and I mean any fluid! Water, urine, Scotch what ever is available.
2- Keep the reservoir filler cap on only FINGER TIGHT! You don't want to be fumbling around for a wrench if it's cinched down tight.
3- Keep your landing gear mechanism lubricated. At least every annual make sure all the grease fittings are working and the mechanism accepts the grease. There are some pivot points that will only need to be oiled. My dad used to say, "You can never have too much lubrication." (See photo below for lubricating areas)
4-Check for corrosion on all landing gear parts. After all we all land on water and sometimes salt water. This can cause corrosion. Spray all interior parts with your favorite anti-corrosive spray. And check for cracks!

5-It appears that with the gear not locked down or up, a water landing is the best course of action (Gear in trail).
6-Don't panic and call your favorite Seabee pilots for advice if you have time. Put the phone numbers of Seabee owners in your phone!

Let's consider the options before the decision is made:

Airport landing:
This would be the only option if there was no water around and flight time was limited. The landing should be made on the grass (if it's long enough) and into the wind as much as possible. If the flaps are available use them and land as slow as possible. After touchdown below about 40 MPH the Seabee will want to weathervane into the wind so one wing will begin to drop. (Don't ask me how I know). When it does the wing float will contact the ground and damage is sure to ensue. The float and float strut will most likely be damaged ($$$). You might do a low pass first to inspect the grass for ruts and rocks that could cause more damage. After landing you'll have to figure out how to get the Seabee back on the gear (that's another story).

Water landing:
With the landing gear "in trail" this appears to be the best option as history has proven. If you have flaps, use them and land as slow as possible into the wind. If you are full of gas fly until the Seabee is lighter which will allow you to land at a slower speed. Land as close to shore as you can in case you have to "evacuate". Do not inflate your life vest(s) until you are literally in the water. Be ready for that pitch down moment and copious amounts of water. Without flaps, the touchdown will be at a higher pitch attitude that will cause the tail wheel or aft section of the hull to contact first, thus causing the aircraft to "plunk" down. If you've ever landed without flaps, you probably noticed that the Seabee touched down tail wheel first. Doing this on land or choppy water could be worse than landing slightly faster and flatter which could be beneficial. Speaking of tail wheels, with zero hydraulic pressure, depending upon what failed, the tail wheel could be down or up. Check your mirror on the float or float strut. The tailwheel can be seen fairly well by looking at the "wing down" mirror in a turn where the airplane is silhouetted against the sky. Landing on water with the tail wheel down is rather violent and would add to the pitch down moment.

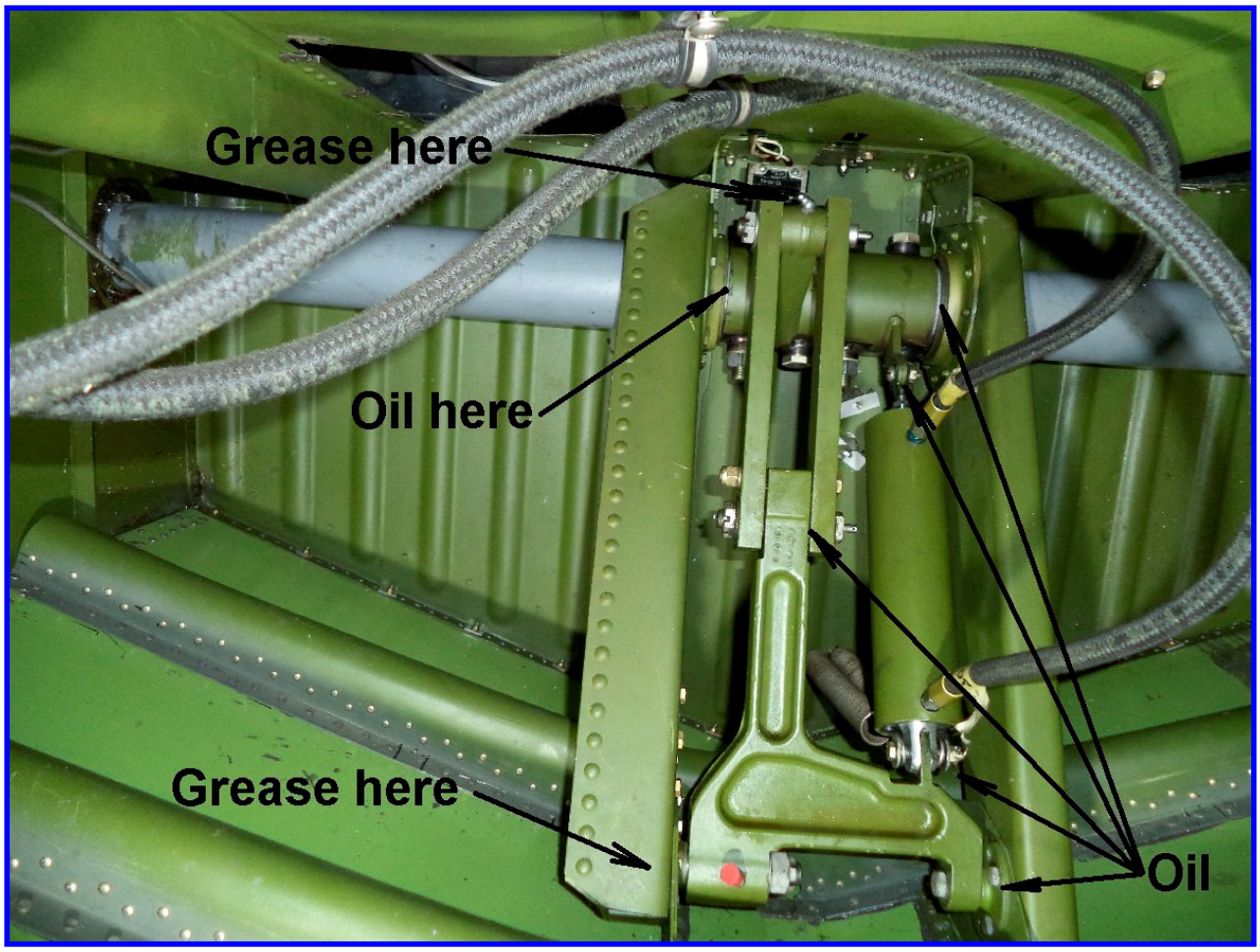
As with any emergency landing on water it's always a good idea to unlatch the doors and without shoulder harnesses, have your front seats as far aft as you can and still be able to have full control. While the chances are minimal of flipping over, with the tail touching first, the runout will be short and abrupt.

Brief your passengers on what to expect and life vest use. Taxi to a beach or dock and regroup.

As far as the initial "call" goes it was difficult to hear John as he was circling due to one thing or another but I think if you find yourself in a similar situation fly as low as you can to pick up a cell tower. Experience has shown that below 1000' AGL is a good cell tower altitude. Phones don't seem to pick up the tower above this altitude. The problem may have been the "Other Seabee pilot's" phone as well.

Broken “H” bracket (Part 1112)

Broken fittings on landing gear actuator



Lubrication points on the main landing gear mechanism

Republic recommends engine oil for the “Oil” locations and waterproof grease for the “Grease” locations. The above locations should be lubricated every annual or whenever you have the back seat and floor covers removed. Notice the large cross tube fittings; they do not have grease fittings that are easily accessible so just use a liberal amount of engine oil on both sides of each of these fittings.

Remember: Oil reduces friction and grease reduces wear.

Thanks to John for his excellent report and good judgment. And thank you to all the people who answered his phone calls!