

# THE HOWARD AVIATOR

## Fuel Tank Selection on the Howard DGA-15P

Recently, the Howard community lost a fine example of the DGA-15P. Happily, due to rapid reflexes and appropriate control inputs on the part of the pilot, Todd Shultz, this accident occurred without significant injury to the two occupants of the airplane.

The accident occurred September 30th at the Kern Valley (L05) airport. What follows is an excerpt from the NTSB's preliminary report. This is an initial survey of known facts and does not seek to determine causal factors:

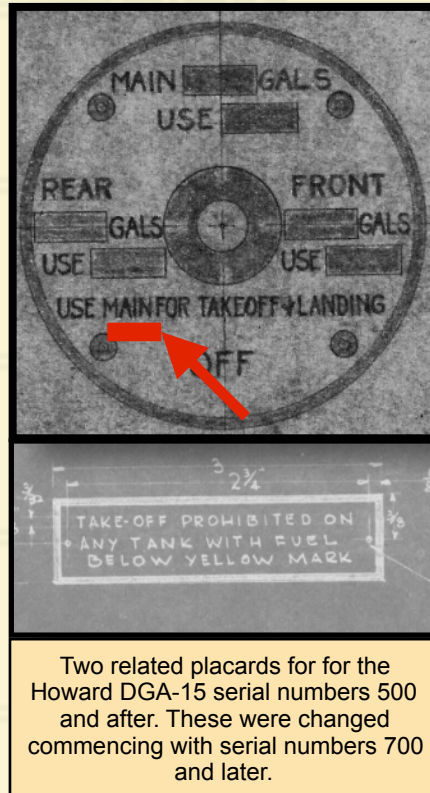
*"After completing the run-up checklist, the pilot selected the center fuel tank, which was about 3/8 full. The forward tank was about half full. He then waited about 10 minutes for the traffic pattern to clear and then entered the active runway where he began his takeoff roll. The airplane lifted off the ground at about 70 mph and accelerated to about 85 mph in a 10° nose high attitude. The pilot recalled that the airplane reached about 50 ft above ground level before he encountered a total loss of engine power and started to descend rapidly."*

Rapidly approaching the ground, and in spite of appropriate control inputs, the aircraft did not retain sufficient indicated airspeed to arrest the descent rate during the landing flair. The consequent impact resulted in the collapse of the main landing gear and the complete destruction of the aircraft in the subsequent post-crash fire.

One item which stands out in the preceding statement by the NTSB, and reflecting Todd Schultz's comments, is that the main (the NTSB referred to it as the center) tank was selected for take-off. It should be noted that Todd Schultz's airplane was placarded to select the main tank for take-off and that he had a prior owners checklist directing that very same action. This has attracted a great deal of interest and, not unexpectedly, conjecture. This is said inasmuch as it is conventionally accepted that the forward tank is to be selected for take-off and for landing in the Howard DGA-15.

This is the factory direction for most all Howard DGA-15s. The obvious rationale for this Howard Factory guidance is that the selection of another tank, in particular the main tank, can result in the un-portioning of the fuel sump due to a number of factors. Amongst these are the location of the sump, the fuel quantity in that tank, the aircraft pitch attitude, and the aircraft acceleration.

As with many such things, however, there is more to this story. Research into the Howard



Two related placards for the Howard DGA-15 serial numbers 500 and after. These were changed commencing with serial numbers 700 and later.

DGA-15 factory drawings indicates that the selection of the forward tank has not always been the factory guidance. When viewing the factory drawings, and referencing the placards for the aircraft serial numbers 500 to 700, the direction to the pilot is to select the main tank for take-off and landing. Further, another placard for that same series of aircraft indicates that one may not take-off with any tank selected that indicates less than a fuel quantity above the yellow band. The implication from that placard is that in this series of early Howards, take-off was indeed permitted on the main tank. However, this was only when the fuel total in that tank was above the yellow mark and therefore sufficient to preclude the un-portioning of the fuel pickup.

Interestingly, of the persons contacted for this article none were aware of any currently flying Howards which have a fuel quantity indicating gauge graduated with a yellow band as indicated on the aforementioned placard.

What follows is conjecture only. It appears that the civilian Howard DGA-15s were initially directed to take-off with the fuel selected to the main tank. As mentioned previously this would have been done with the pilot ensuring that the fuel total in the selected tank was above the permitted minimum level.

In serial numbers 700 and above this apparently changed. Placards for these tanks clearly dictate that the front tank must be used for take-off and landing. These would have been Howards affected by changes required by US Navy or US Army AirCorps specification. It appears possible that incidents or accidents may have revealed the potential for the un-portioning of the main tank. It is logical to conclude that this precipitated the change in tank selection for the later serial numbers.

When one considers the location of the fuel pickups for the three tanks, it becomes easy to identify the liability of departing with the main tank selected. On the main tank the fuel sump is located mid-tank with the fuel pickup located at the most forward point within that sump. With a fuel total in the main tank approaching a value of a third to a quarter tank full the acceleration of the Howard in concert with the pitch attitudes attainable when the aircraft is light could lead to the un-portioning of the fuel pickup of the main tank.

It has been related to me by Howard Foundation member Tom Morris that a Howard sitting in its three point attitude will not pull fuel from the center tank if the fuel quantity is less than a value approaching 20 gallons. So, roughly a quarter tank.

Howard Foundation member Jerry Lugten was a new DGA-15 owner when he had a similar experience (That story on page 9). At no point in his training had he been instructed to select the forward tank for take-off and landing. Further, though Jerry's aircraft was a later variant of the Howard and should have had a placard directing the selection of the forward tank for take-off, his fuel selector placard stipulated the selection of the main tank (Note the picture on page 9). So, Jerry had one of the earlier placards on an aircraft which should have been placarded to direct take-offs with the forward tank selected. As a consequence, Jerry had a nearly identical adventure to Todd Baker's accident mentioned previously. This occurred while Jerry was attending the AAA fly-in at Blakesburg, IA. Jerry was able to

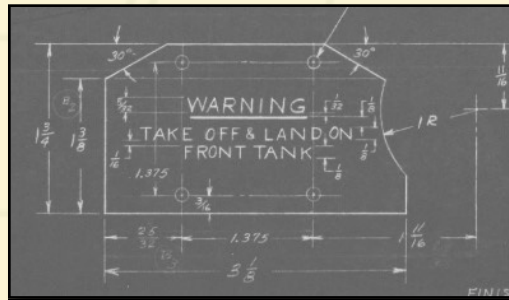
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barely land the airplane on the remaining length of the fairly limited runway.

John Graham also had a similar incident. Fuel interruption occurred at roughly 50 feet during a take-off from his home airport in the Pittsburg area. Though he landed without any significant damage, the FAA investigated the incident. It was determined that the fuel selector had been selected to the main tank and the fuel quantity in that tank was significantly less than half full. This led to an interruption of fuel flow to the engine.

Research of two different repositories of aircraft accident information has indicated similar DGA-15 accidents and incidents occurring as early as 1945 and as far afield as Australia. These are the USN records and the CASA records (Civil Aviation Safety Authority of Australia).

All Howards from serial number 700 and beyond should have a placard for the fuel selector which stipulates that the forward tank must be selected for take-off and landing. This point is re-emphasized commencing with serial 934 which adds another instrument panel



Fuel placard for the instrument panel of later serial numbered Howards. This was added at serial number 934 and for all Howards thereafter, indicating a re-emphasis on the import of this operational directive.

placard that further reinforces this operating principle.

Some of the earlier Howards allowed take-off and landing using the main tank, this was permitted only with the fuel quantity above a graduated yellow marking on the fuel quantity indicator.

Inasmuch as all Howards have been restored or improved upon many times through their

lives, the possibility exists that the placarding may be incorrect for the particular serial number.

A Howard with a serial number in the 500 series may be placarded to allow take-offs with the main tank selected. However, should this be the case, and the pilot elects to select the main, the factory drawings clearly indicate the need for another placard which demands that the fuel quantity in that tank be above the yellow band on an appropriately marked fuel gauge.

It is incumbent upon the owner and operator of the aircraft to ensure that the placarding and instrument markings of the aircraft are consistent with the factory requirements for that particular serial number.

The information presented in the preceding articles are exclusively for the consideration of the owners and operators of Howard aircraft.

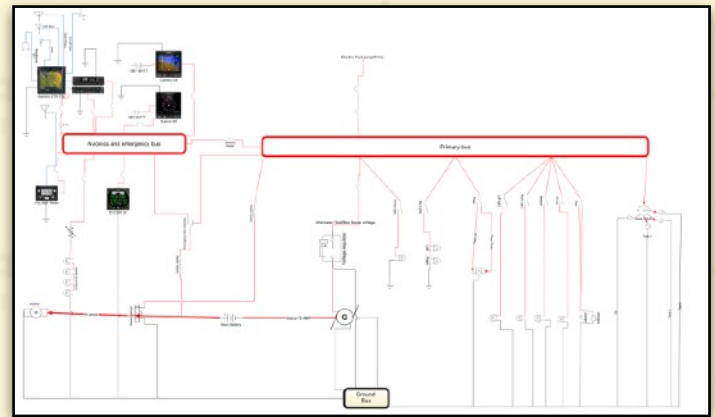
The responsibility for the proper operation of their aircraft rests exclusively upon the owner/operator and, in particular, the pilot in command.



In my most recent visit to AirVenture I spent a great deal of time with Gene Velasquez, the owner of Panel Planner. His program was specifically designed to help individuals map out the location of instruments on their instrument panel and achieve the look and functionality desired. Merely tell the program what type of airplane you have and it pulls up the appropriate template. After that, one merely drags and drops the selected radios and instruments into their desired location. It is very fluid, intuitive and easy to use.

I provided Mr. Velasquez with the correct dimensions for the panel of the Howard DGA-15P. This template is now available for selection by restorers of the Howard DGA-15. After one is finished with the panel lay out, the program will also output a CAD template which will allow the panel to be machine cut with the proper dimensions and all instrument holes correctly sighted. You only have to install the instruments.

[www.panelplanner.com](http://www.panelplanner.com)



Not too long ago, as I was considering the design of the electrical system for OI Smokey, I happened upon a program which renders the entire task to a simple and even fun project. The web based software is called smartDraw and makes the task of envisioning and rendering the electrical design a pleasure.

Lines are easily drawn with its snap to grid feature. Adding

elements such as switched, breakers, antennae, grounds, lights, etc. are all done by merely dragging what you wish into the desired position on your schematic. Very easy.

As a matter of fact, the electrical schematic pictured above was completed in a little over an hour and is completely modifiable as future considerations dictate.

[www.smartdraw.com](http://www.smartdraw.com)