

Locating and Sizing Access Holes for Aircraft Inspection and Repair

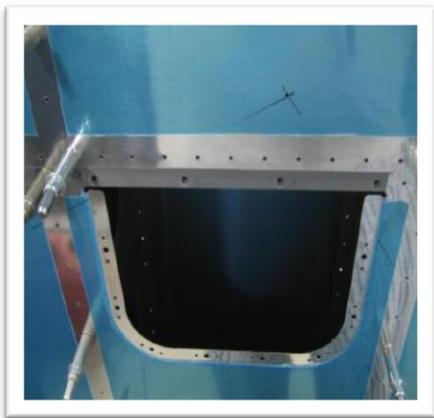
Tech Report by Jerry Sorrell

Aircraft, whether manufactured in a factory or manufactured by us as builders, will have access holes or removable panels for assembly and inspection purposes.

Sometimes the factories do not provide all the access holes that may ultimately be needed to inspect or replace a certain part. (As an example Cessna permits up to five more access holes on the wings for more detailed inspection and repair if needed.) Sometimes a service bulletin or Airworthiness Directive (AD) will be issued that will require an access hole to be constructed to inspect or repair a suspect part. What to do?

For certified aircraft, the manufacture will supply drawings and instructions on how to make the access hole. The details must be followed exactly in order to conform to the factory drawings and be signed off.

Likewise, for experimental aircraft, the access holes should be made to conform to the designer's details. However, as builders, we have some flexibility, but be careful! Depending on the type of construction and the location of the access hole, the integrity of the structure may be compromised if the access hole and cover panel is not constructed properly.



This is an example of an inspection hole that will provide access to the aileron bell crank. Note that the builder has yet to install the nutplates that will be used to hold the cover panel in place with machine screws. In this case, the cover panel provides carry-through torsion strength to the wing as the loads are carried across the cover panel. Had this panel been installed with four Tinnerman clips and sheet metal screws, the structure would not be as strong. See example below.



This is an example of the typical circular inspection panel covers found on Pipers or Cessnas. Usually these are held in place with sheet metal screws and are not intended to be part of the structural design



This is an example of the “slide in place” inspection plates found on fabric covered planes. These provide no structural value, but the hole in the fabric must have a reinforcing ring installed to control tearing.



The military wanted planes designed for ease of inspection. This BT-13 provided for the entire aluminum side skins to be quickly removed. However, the steel tube fuselage provides all the fuselage strength and the side panels just act as covers for streamlining.

Some tips on locating and constructing access holes.

Always confer with the designer.

Make them big enough to allow your hand and any necessary tools to pass through.

Locate them to be clear of any tubes, lines or cables that would otherwise be directly in line.

If the designer is OK with this and the airframe layout makes this practical, consider how you may provide a good size access panel to look down on the inner workings of the instrument panel. Talk to those who have spent time crawling on the cockpit floor with the seats out, looking up into the maze. They will tell you their wish – Jerry S.

<http://www.youtube.com/watch?v=fgZkfiWFDbs>

Check out this interesting video of a how a tailwheel behaves on takeoff and landing on a Mustang. Well worth the view.