

TKS® Installation for Beechcraft Bonanza

Owners with TKS Ice Protection Systems know that a tremendous amount of work is put into the installation. However they are often unclear about the details involved.

CAV Ice Protection is here to share a collection of TKS installation photographs. Please note that the following pictures and descriptions do not necessarily happen in sequence. While there are steps that must happen sequentially, many of the work items can be done in parallel.





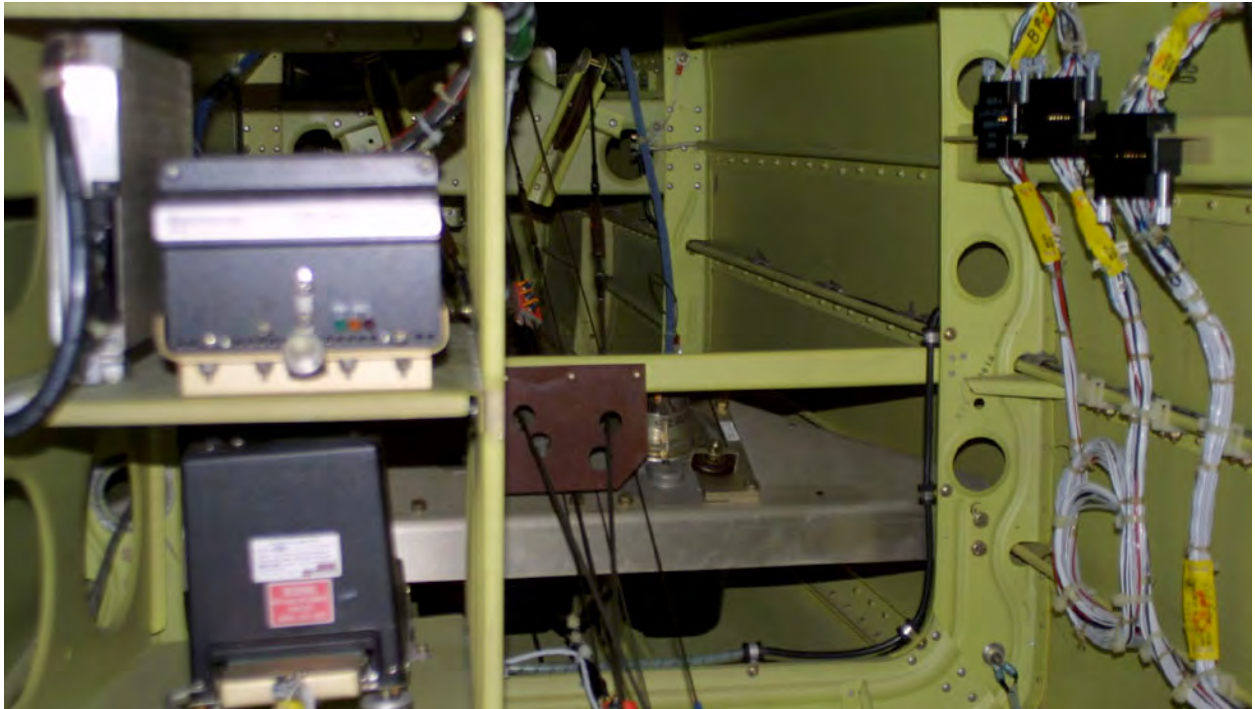
The plane is first put on jacks. Gear doors need to be lowered for the installation. The pump, filter, windshield pump, solenoid and pressure switches will be installed in the right wheel well.



The r/s tip tank is pulled to allow routing for plumbing.



The interior is stripped to give the installer access. Plumbing will be routed throughout.



The empennage is opened to allow routing for plumbing to the tail.



The prop is pulled and sent back to a dedicated workroom for slinger ring installation.



The slinger ring is installed in a dedicated workroom.



TKS Ice Protection System Control Panel.

1. High Pressure Indicator

When illuminated, the high pressure indicator most commonly indicates your filter is reaching the end of its useful life.

2. Reset Switch

The reset switch is used to check and ensure the High Pressure indication is not the result of an electrical impulse.

3. Photo-sensor

The photo sensor dims the illumination. The small set-screw immediately below is used to set the sensitivity.

4. Ice Light Switch

The ice light will be located on the left side of your engine cowling and illuminates the left wing.

5. Windshield Button

Pressing the windshield switch initiates a burst of TKS fluid from the windshield spraybar.

6. Flashing Red - Low Pressure Placard

The placard tells you what a flashing red light on your flow selector indicates. When there is low pressure in the system, the non-selected indicator will flash red. (Example: If you turn on the system with De-Ice selected, the Anti-Ice indicator will flash red until the system is brought up to pressure.) This is normal.

7. Fluid Level Indicator

The fluid level indicator indicates fluid reservoir status to the tenth of a gallon.

8. Flow Selector

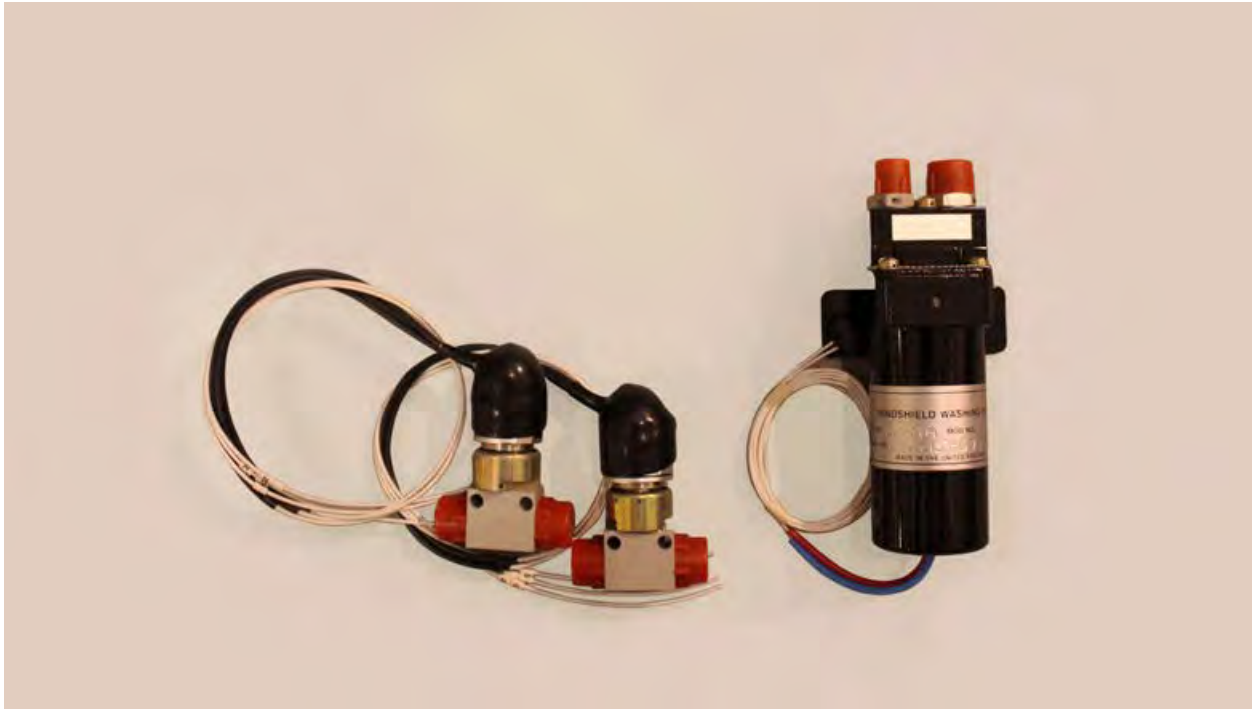
The flow selector allows for the selection of Normal or Maximum flow rates.



The six port proportioning unit is used in one of the wings. Its twin will be located in the adjacent wing. The three port proportioning unit is used in the tail to send fluid to each horizontal stabilizer and the vertical.



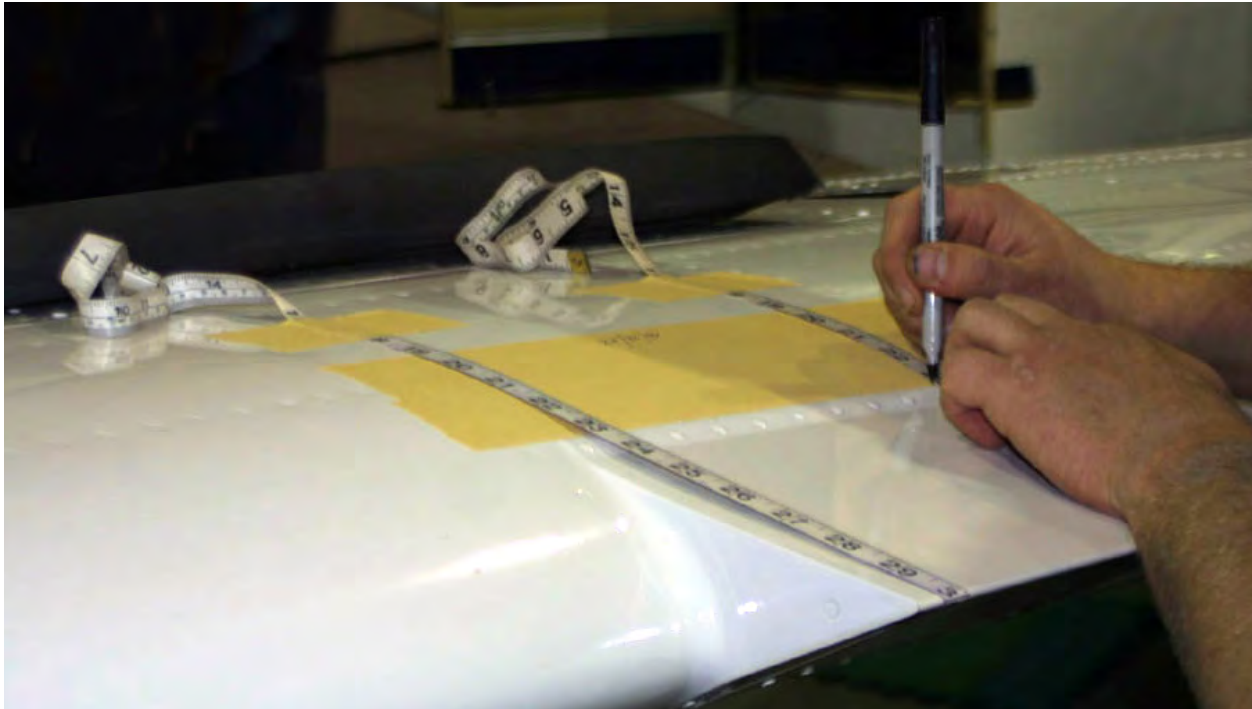
TKS Metering Pump and Filter.



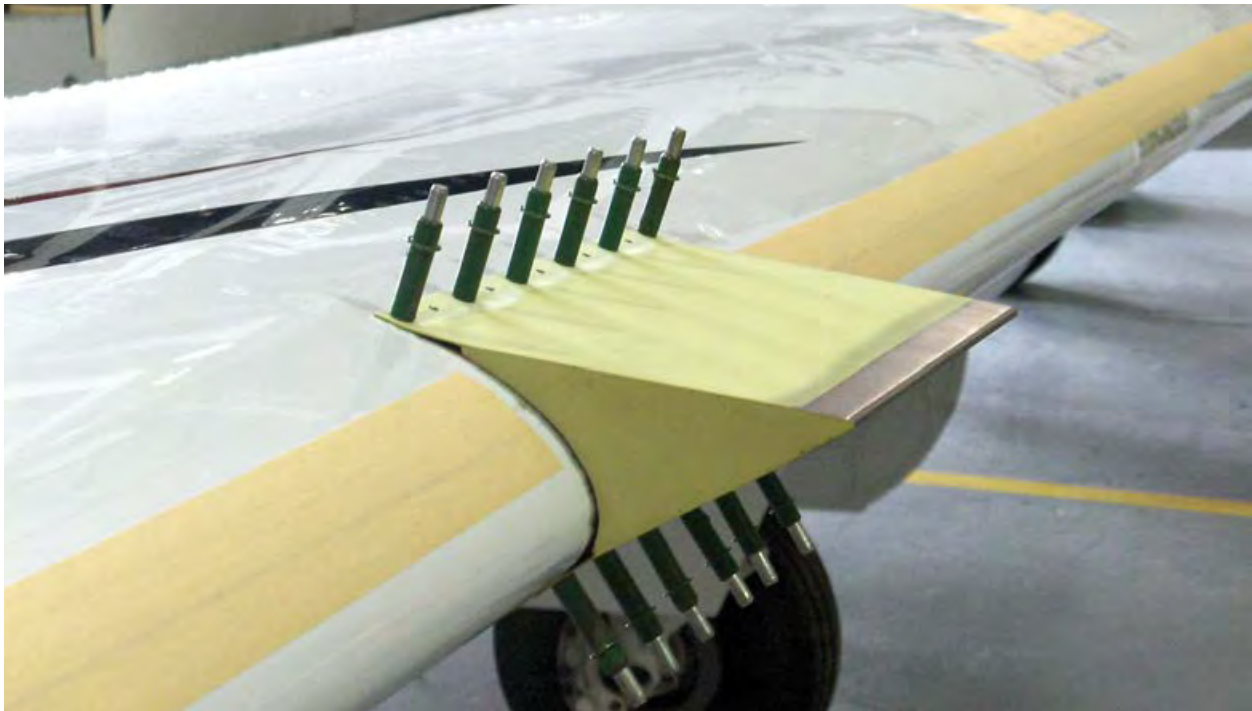
TKS Pressure Switches (High and Low) and Windshield Pump.



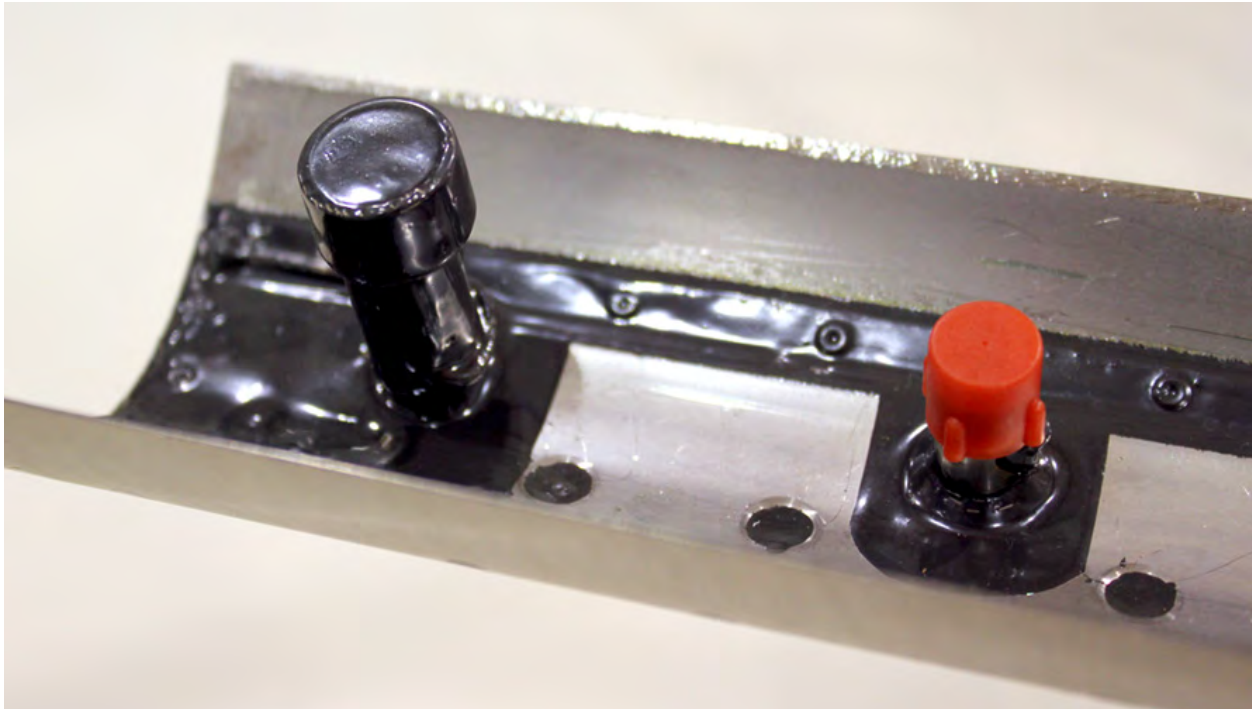
Stall strip locations are recorded and stall strips are removed. New, porous titanium strips will be installed over the TKS panels and will exude TKS fluid to help prevent ice accretion.



The location of the leading edge vortex generators is marked. The vortex generators are removed from both wings and replaced with vortex generators with a built in porous TKS panel.



The TKS replacement wedge prior to installation and paint. The silver edge is porous and exudes fluid.



Air bleed valve in TKS panel.



The initial fitting of the panels to the leading edge will be removed, trimmed and bonded.



The bladder is inserted into the wing and the filler neck is installed.



The bladder tank receives padding. Right wing is pictured here.



The TKS filter, low pressure switch, high pressure switch and main pumps are located in the wheel well looking outboard.



The main pump and windshield pump are also located in the wheel well (aft view). Hidden from view, the solenoid's position is evident if you follow the tubing.



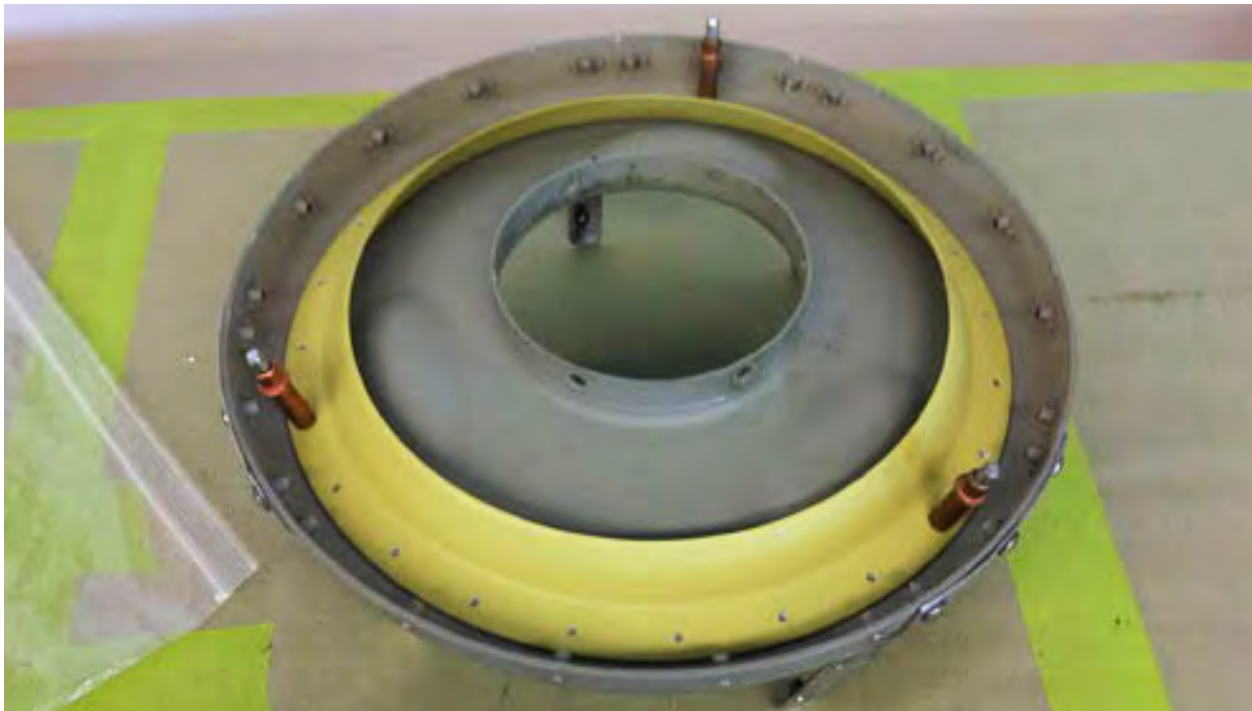
TKS boots are applied to the prop blades.



Edge seal is applied to the boots, then dried. The ribs on the boot direct fluid down the blade.



Edge seal drying.



The TKS slinger ring is riveted to the spinner bulkhead.



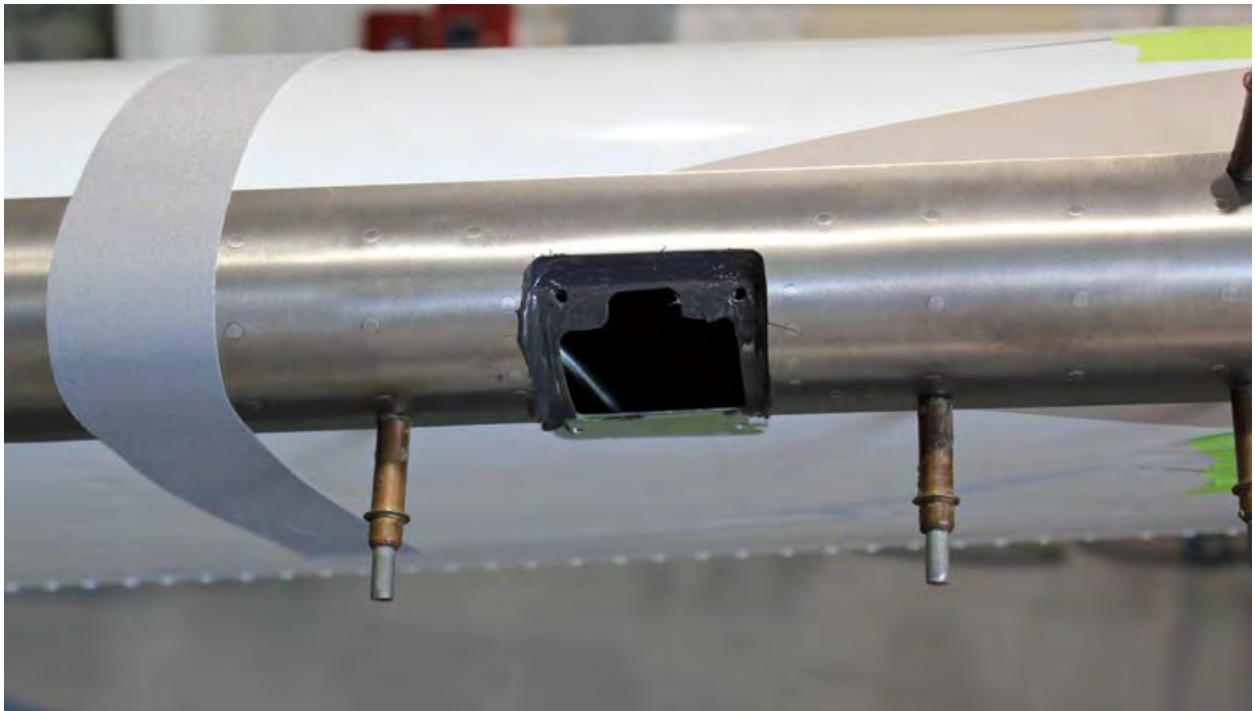
The windshield spraybar is installed under the left side screen.



A deflector is bonded and riveted over the windshield spraybar.



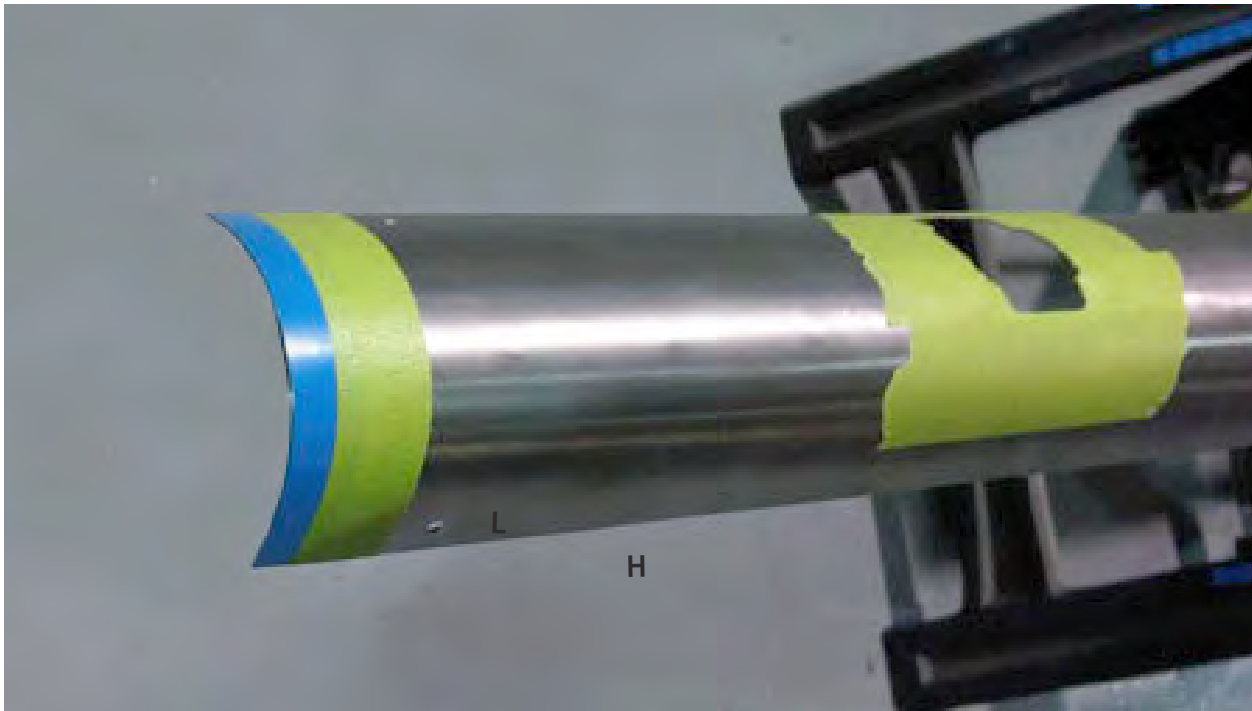
The TKS panels are pulled from the leading edge, then ground and formed to precisely fit.



The right side leading edge is prepped to receive the heated stall vane.



The edges of the panel have been ground to present as small a transition as possible.



Each TKS panel is taped prior to bonding.



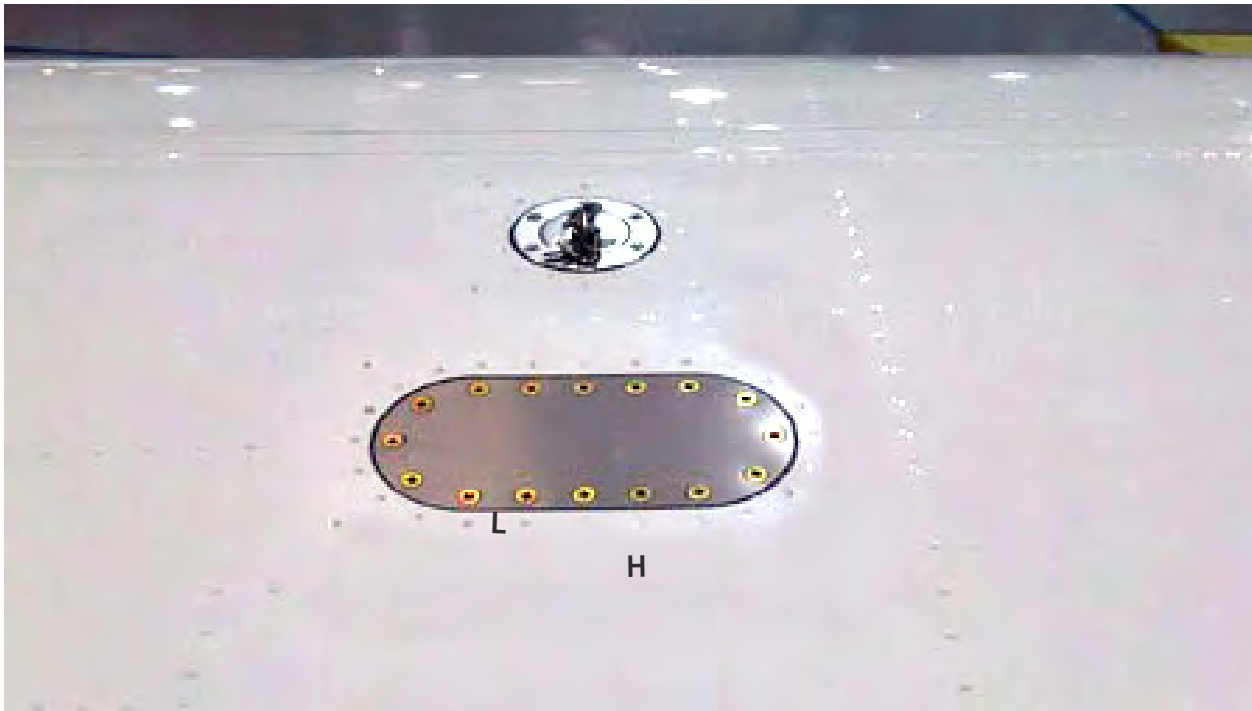
The rivets in the corners are sacrificial members, not intended to secure the panels to the aircraft.



Locations where the stall strips will be installed are taped and prepared. The stall strips are filled with a foam material that spreads the fluid along the entire surface.



The stall strips are worked into the correct shape to fit flush against the panels, then bonded.



After the tank flange is secured and sealed, the panel is installed with PRC and screws.



The slinger ring bonding agent has cured and the brackets, fluid scoops and feed tubes have been installed. The fluid is collected by the scoops inside the sling ring and passed through the feed tubes to the prop blades.



The spinner backplate is reinstalled to the prop.



A firehouse is installed to bring the fluid to the prop.



A stainless steel tube brings fluid over the engine.



The prop is reinstalled and will be dynamically balanced toward the end of the third week.



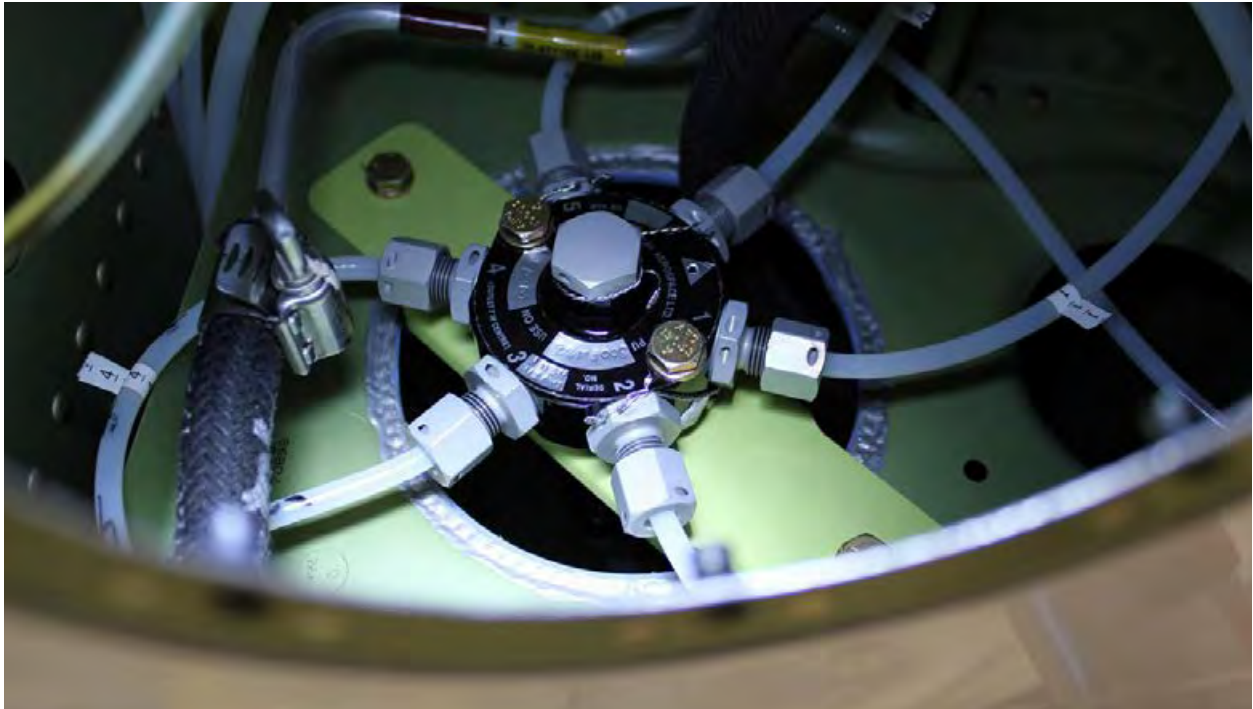
The TKS Ice Protection System Control Panel is adjusted and installed.



Stall strips for the leading edge are installed.



Stall strips for the wedges are also installed.



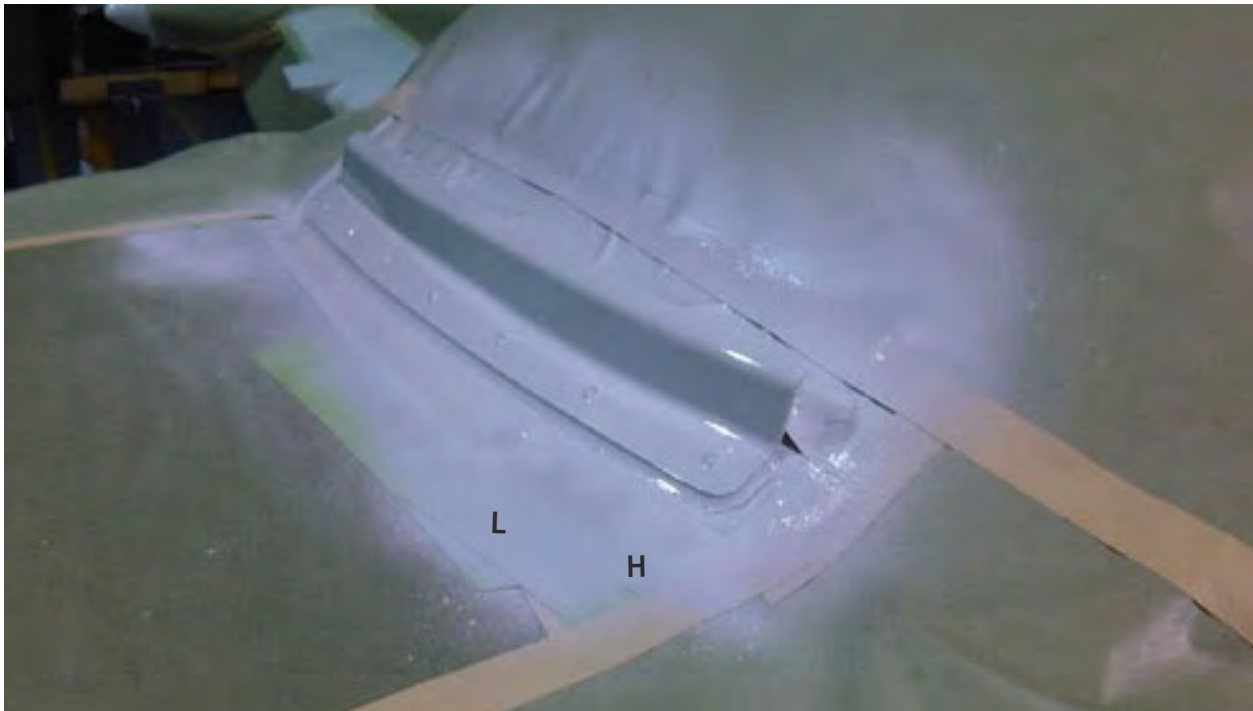
The right wing proportioning unit is installed.



The tail proportioning unit is installed.



The tip tanks are replaced.



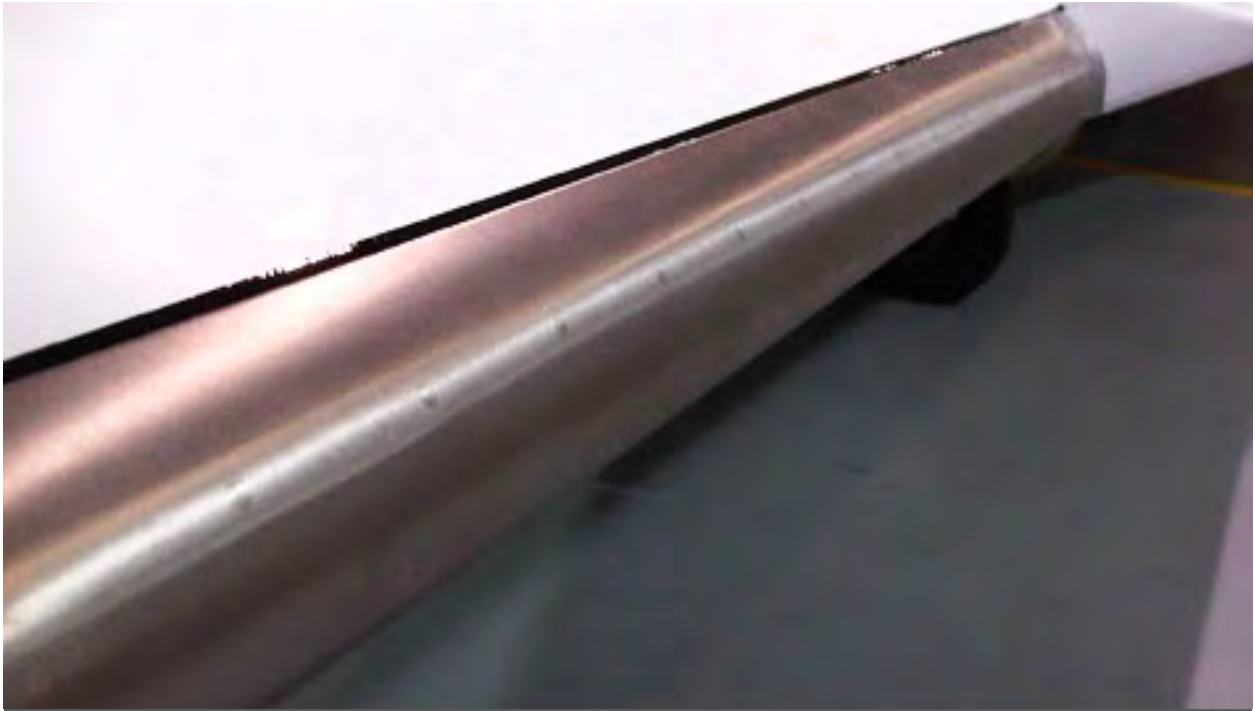
Areas requiring paint are taped off, painted and allowed to cure over the weekend.



The paint cures on all surfaces over the weekend.



An ice light is installed in the left side cowling. The light will illuminate the left wing and is controlled by a switch on the TKS Ice Protection System Control Panel.



All TKS panels are taped off for edge seal, then allowed to cure for 36-48 hours.



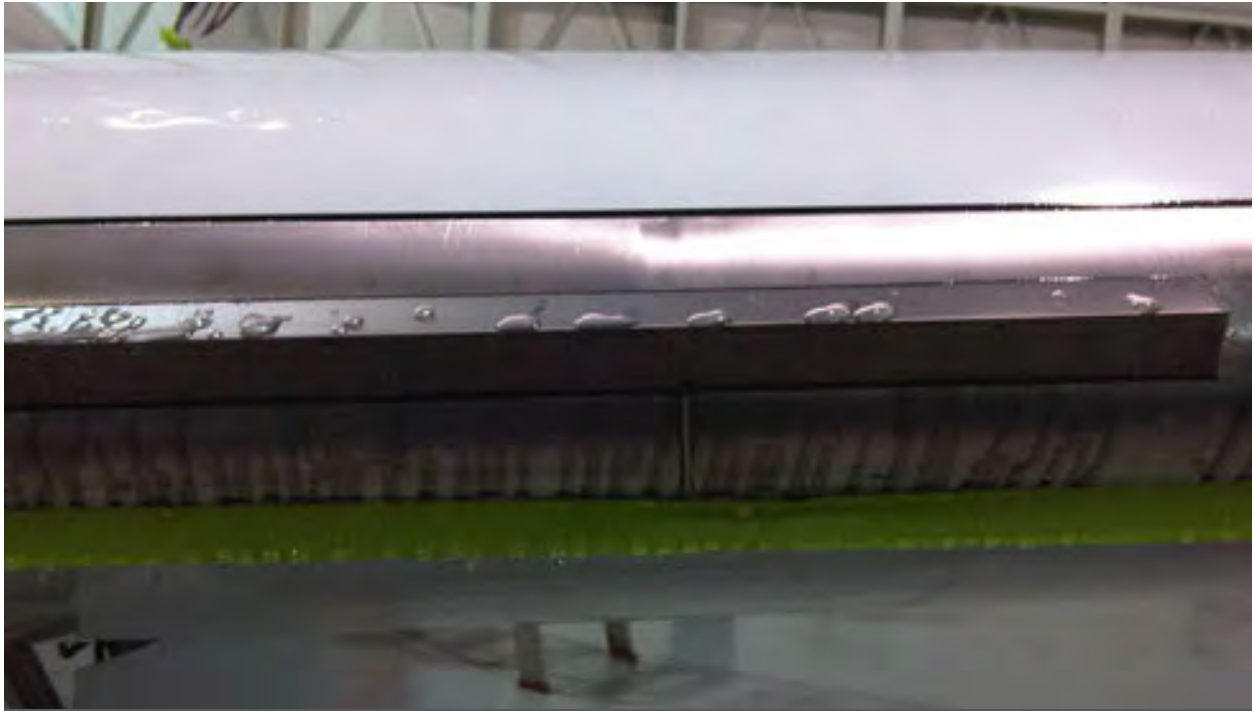
The edge seal provides a smoother transition, fills in the small ledge behind the TKS panels and is more aesthetically pleasing. The bonded panels ensures no moisture gets in.



The fluid lines leading to the panels are disconnected from the aircraft's proportioning units and attached to test units.



After the edge seal has cured, the TKS Ice Protection System undergoes testing. Panels are slowly brought to 70 psi in order to purge and check the flow. Under normal operation the panels will see 3-5 psi.



The stall strip is in operation during testing.



The wedge is in operation during testing.



Related Links

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Beechcraft Bonanza](#)

[TKS Ice Protection for
Beechcraft A36 FIKI](#)

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