INSTALLATION INSTRUCTIONS
FOR
D'SHANNON AVIATION
LEFT AND RIGHT FORWARD SIDE WINDOWS

1. a.) Remove plastic moldings by removing #2 trim screws (Late Model)
   b.) Remove small #1 trim screws and remove metal trim molding (Early Model)
   Mark on existing hat section around perimeter the location and direction of each molding trim tab. The hat section is the structure framing that is inside the skin and to which the skin is riveted. Trim tabs are all individually drilled. Care must be taken that you document the position and location of each trim tab for re-installation.

2. Remove bulkhead upholstery tabs if equipped.

3. Remove the window by drilling rivets or removing screws and nuts. Clean out all caulking from the inside of the frame.

4. The new window must be placed into the inside top of the hat section first. Apply pressure to the bottom of the window until the window pops into place.

5. Check on the outside of the aircraft to see if the radius of the hat section will allow the window to pull up flush against the skin. If the window fits flush against the skin, continue the installation with step number 5. If the window is not flush, mark the areas with a grease pencil while the window is in the aircraft. Remove the window by reversing step number 3 and trim, following the instructions for trimming plexiglass. Return to step number 3. Repeat this procedure until the window fits flush with the skin.

6. Match mark existing airframe holes onto the window using a drill and a #30 plastic bit. Drill a straight hole extremely slowly and carefully so as not to pop out a convex section on the other side. Drill from center of sides down, then up, maintaining a little pressure on all positions while drilling. Repeat procedure across the bottom and top. Use clecoes or screws to hold the window in place.

7. With window in place, apply a strip of masking tape right along the edge of the airframe skin onto the window. This masking prevents sealer that might squeeze out and get onto the window.

8. Remove all screws or clecoes holding the window.

9. Remove window.

10. Drill all window holes oversize using a 1/4" plastic drill bit. Chamfer both ends of holes with a 100-degree countersink to ensure a smooth finish. Remove all chips.

NOTE

Countersinks have a tendency to chatter. A chatter mark in the window can initiate a crack. Use of a six or eight-flute countersink will minimize chatter. Any chatter marks that appear must be finished with a fine stone to ensure a perfect finish.

11. Sand or buff off any nicks or gouges that might be on the perimeter edge of the window.

12. Countersink or dimple every hole in the window flange with a 100-degree tool to accept screw heads, if not already done.

13. Install window into place. Insert the screws. Just start nuts and washers onto screws, place trim tab retainers in original positions, if equipped. Do not tighten down nuts yet.

14. Masking tape over the screws up to the edge of the airframe skin. This tape, just as in step 7, is to prevent sealer from getting on the skin.

15. Using a caulking gun or putty knife, insert mixed sealer between the window and the airframe skin. Care must be taken to see that 100-percent of the screw holes are filled with sealer. NOTE: Air and water leaks are generally caused from lack of care at this point.

16. Tighten the screws up, barely enough to contact the underneath surface of the window and so that there are no spots where the sealer is not uniformly spread between the window and the flanges it is against. The sealer, when hardened, becomes an integral part of the plane. Cut off screws with a small bolt cutter.

17. Before the sealer hardens, attach interior trim with screws to trim tabs so that screws do not have to move after the sealer hardens. This can be best accomplished by adjusting the trim tabs to the approximate position of the holes in the trim using the distance the holes are from the hat section as a guide. Screw in the bottom screw first, then bow the molding slightly inward to attach the last screw in the top. Gently push the molding over center into place and put in the remaining screws. Leave all screws loose until all have been started: then snug into place.

18. Remove all sealer with a plastic putty knife before it dries. Remove all masking tape from window and fuselage. Use isopropyl alcohol to wipe off any sealer that may have gotten on the window or fuselage beyond the tape. Do not use other solvents. Only alcohol will remove sealer without damaging the window.

19. Make appropriate entries in aircraft records and make out FAA form 337.

20. Stand back and admire a much better looking aircraft.

CAUTION #1 Never use solvents such as lacquer, MEK, acetone, etc, near or around the windows. Never leave a can or jar open inside the airplane. Do not close the airplane up when any vapor from chemicals used to install panel covers or some upholstery glues until thinners have evaporated. The vapors have an adverse effect on plexiglass.

CAUTION #2 Procedure in drilling to be aware of:

1. Never use a standard drill bit. Use a modified bit or one specifically sold for plastics or acrylics.

2. Never push drill bits through plex so that when the bit comes through it leaves any minute fractures.

3. Always polish window from side to side, never top to bottom or round motion. This will keep you from having sun spots appearing.

PLEXIGLASS AIRCRAFT WINDSHIELDS - HANDLING - DRILLING - TRIMMING

GENERAL: Only a few of our windshields will require trimming upon installation. However, many will require drilling and all will require proper handling. It is our intention of presenting a general procedure here that will insure proper and easy installation. When more specific information is required, please call first.

HANDLING: Keep windshield well supported at all times. Do not allow a handling strain to be put on the windshield during any trimming, grinding or other handling of installation. A warm temperature for the Plexiglass is not a requirement for trimming, drilling or handling during installation, but Plexiglass will tolerate more straining and mishandling at an 80 or 90 degree temperature than would be allowable at 40 or 50 degrees.

* REMOVE PROTECTIVE PAPER AND INSPECT WINDOW FIRST. THEN REAPPLY THE PAPER *

PREPARATION FOR INSTALLATION: Remove only the amount of protective paper from the windshield that will be necessary for installation. This will be for portions going into the windshield channels or under fairings. Fold the paper back from the edges and crease sharply. Tear the paper along the crease and you will have a neat job. It is best to leave the protective paper on the windshield until installation is complete. The protective paper will help in protecting the windshield from abrasion during the handling of installation. Please remove any adheive and clean the windshield immediately upon removing the protective paper. (See sheet on care and treatment of Plexiglass). If the windshield is not immediately cleaned upon removing the protective paper the adhesive residue on the windshield will attract dust or other abrasive particles. Cleaning then may become a scouring operation.

MARKING THE WINDSHIELD FOR TRIM: Mark the windshield for trimming with masking tape or with a china marking grease pencil.

TRIM METHOD 1: Use an autobody sander with at least a 7" 80 grit disc. Round window edges when proper trim is achieved.

TRIM METHOD 2: (Can be used for windshields of compound curvature). Very often the old windshield will not be in suitable condition for use as a pattern and the windshield will have to be fitted by a cut and try method. This method can be very accurate with nothing left to be desired in the finished installation. With the high wing and cowl fairing removed, place the new windshield in position on the airplane letting it lay over at the top and sides. Mark and trim the bottom first. When marking the bottom for trim, make sure that the windshield is in the proper alignment at the wing roots or that trimming will bring about alignment at the wing roots. Completely trim and fit the bottom of the windshield first, (applies to high wing aircraft in particular). After trimming and fitting the bottom, trim for the sides and top should be easier.

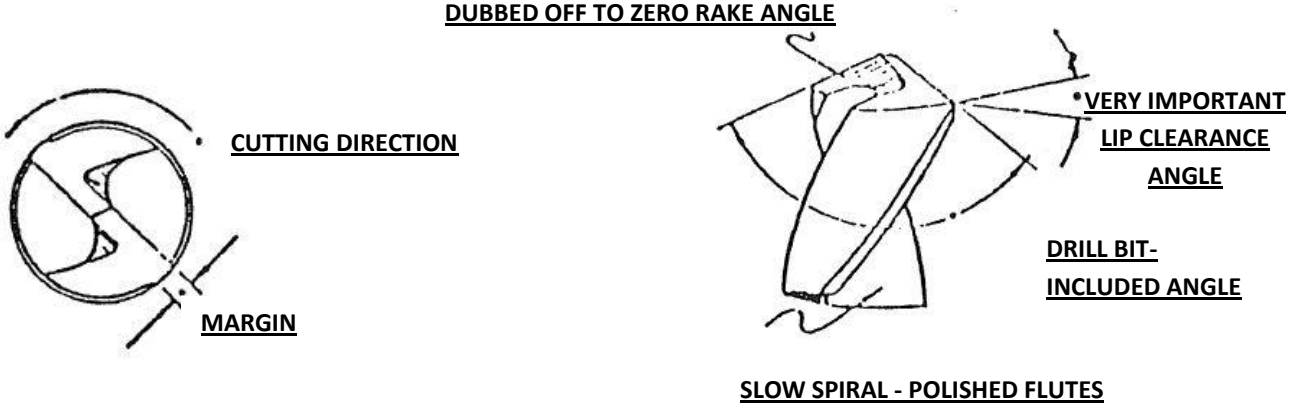
TRIM METHOD 3: Place the old windshiled inside the new windshield and mark trim. This will give an oversize approximate trim. We seldom find use for this method, however it can be used prior to finishing with the previous method 2.

WINDSHIELD TRIMMING: Trimming can be done with a band saw using a 1/4 inch blade with 14 or more teeth to the inch. The windshield and edges should be well supported during the sawing and for any other work on the windshield. Clamp a wood block up against the saw blade so that in sawing it isn't necessary to rest the windshield or have it come in contact with the band saw table. Another option if desired, mask off the band saw work table so that the plastic will not be scratched by the work table during sawing. After sawing it is important that the edges be smoothes as this lessens the tendency towards edge cracking and affects the service life of the windshield. It also lessens the risk of cracking the windshield during installation. Smoothing or edge finishing is best done with DA Sander with 120 grit paper or a small 1 1/2 inch diameter drum type sander that can be turned by a small drill motor. For most effective edge finishing, the grinding should be done in the same plane as the plastic surface which is also the easiest way to use the drum sander. Edge finishing may also be done with the round face of a medium cut bastard file and some double 0 sandpaper.

WE DO NOT RECOMMEND that trimming be done with a jig saw, saber saw or hand saw. If trimming is only minor and it must be done by hand then use a coping saw with a blade that has about 30 teeth per inch. It may work best by putting the blade in backwards, that is with the teeth pointing towards the handle. Extreme care must be taken in that the teeth are not allowed to catch or hang up in the material and cause a crack. Keep the plastic well supported during sawing. Don't allow the edges of the material being sawed to pinch the saw blade.

DRILLING HOLES IN PLEXIGLASS: Drilling holes in Plexiglass is thought to be difficult among many aircraft mechanics. The principal difficulty lies in that drill bits sharpened for steel or aluminum are used. It is almost impossible to drill a hole in Plexiglass when using a drill bit that has been sharpened for drilling steel and especially so of the hole is much larger than 3/16" diameter. Drill sharpening for Plexiglass is relatively simple. Take the drill as sharpened for steel and square off the cutting edge. The object is to sharpen the drill so that it scrapes its way through the plastic without a tendency towards digging in. Sharpen your drill as shown. Try it out on some scrap plastic or your old windshield before drilling the new windshield. Use light pressure when drilling. DO NOT ALLOW DRILL BIT TO MELT THROUGH THE PLEXIGLASS. IT WILL CAUSE STRESS RESULTING IN "STAR" CRACKING AROUND THE HOLE. KEEP THE DRILL BIT COOL BY IMMERSING IN COLD WATER BETWEEN HOLES.

DRILLING WINDSHIELDS: Whenever screws or bolts are used through holes drilled in the Plexiglass for the securing of an aircraft windshield or window, consideration should be given to the expansion or contraction of the Plexiglass when affected by changes of temperature. Plexiglass expands or contracts with temperature at the rate of 1/16th inch per foot per 100 degrees F temperature change. For example, a line of holes at the top of the windshield 36 inches across, using screws of 1/8 inch diameter would require that the holes be 5/16" in diameter to take care of a temperature increase or decrease of 100 degrees F. When holes are drilled with insufficient clearance, excessive strain is placed on the windshield and may cause the holes to crack out at high or low temperatures. Excessive strain on Plexiglass windshields shortens their service life and ivites cracking and crazing. We recommend that allowance for expansion or contraction due to temperature cover a spread of zero degrees F to positive 170 degrees. The above example would properly fit this situation.



NOTE

1. FOR MODELS AFFECTED SEE MASTER ELIGIBILITY LIST
2. CALK ALL AROUND WINDOWS & SCREW HEADS WITH GRAY OR WHITE STRIP CALK, 3-M CO., NO. 8575 OR SILICONE RUBBER, NO. SE-1403, G.E. CO., WATERFORD, N.Y.
3. MATCH DRILL WINDOW & VENT TO ITEM 5 USING PLASTIC DRILL. CLEAR FOR #8 SCREW
4. BOND ITEM 10 TO VENT WINDOW
5. MATCH DRILL WINDOW TO CATCH (ITEM 8, -1 ASSY ITEM 9, -2 ASSY) USING PLASTIC DRILL. CLEAR FOR #8 SCREW.
6. CAUTION: CATCH STOP TOWARD REAR OF ACFT
7. MATCH DRILL VENT TO HANDLE AFTER ALIGNING CATCH & HANDLE TO FIT & MATE USING PLASTIC DRILL. CLEAR FOR #8 SCREW.
8. CAUT. ON: HANDLE POINTS TOWARD REAR OF ACFT. PERMITTING GRAVITY TO HOLD CLOSED

NO.	PER ASSY	PER A/C	PART NO.	DESCRIPTION	MFR
16	50	59	AN364-632L	NUT	
15	4	4	AN526-832-R10	SCREW	
14	4	4	AN526-832-R8	SCREW	
13	2	2	AN526-632-R10	SCREW	
12	2	2	AN526-632-R7	SCREW	
11	--	55	AN507-632-R5	SCREW	
10	AR	AR	B-1310	SEAL, SELF-ADHESIVE	BERYL AVIATION SPECIALTIES, INC.
9	1	--	B-1306-2	CATCH, R.H.	
8	--	1	B-1306-1	CATCH, L.H.	
7	1	--	B-1311-2	ASSY. LATCH HANDLE, R.H	
6	--	1	B-1311-1	ASSY, LATCH HANDLE, L.H.	
5	2	2	B-1309	ASSY, HINGE	
4	1	--	B-1308-2	WINDOW, VENT, FWD-SIDE, R.H.	
3	--	1	B-1308-1	WINDOW, VENT, FWD-SIDE, L.H.	
2	1	--	B-1300-2	WINDOW, FWD-SIDE, R.H.	BERYL AVIATION SPECIALTIES, INC.
1	--	1	B-1300-1	WINDOW, FWD-SIDE, L.H.	

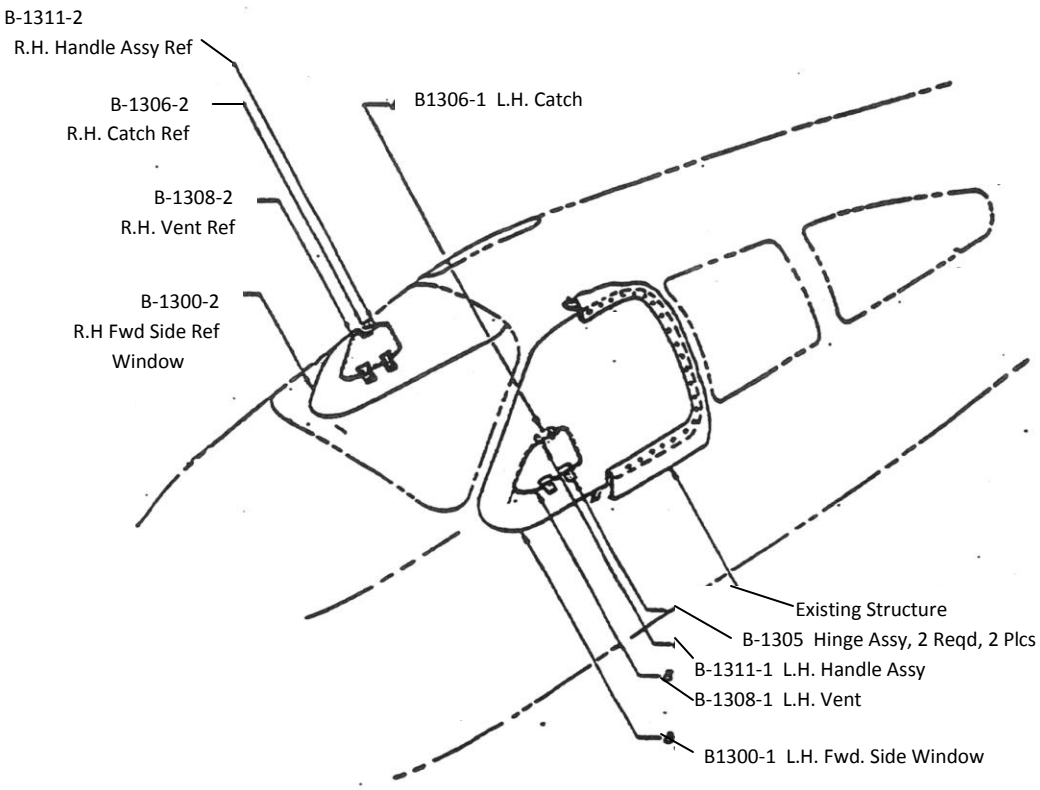
BERYL AVIATION SPECIALTIES, INC. VAN NUYS, CA.

DWG TITLE: INST'L - FWD-SIDE WINDOWS/VENT

SCALE: NONE

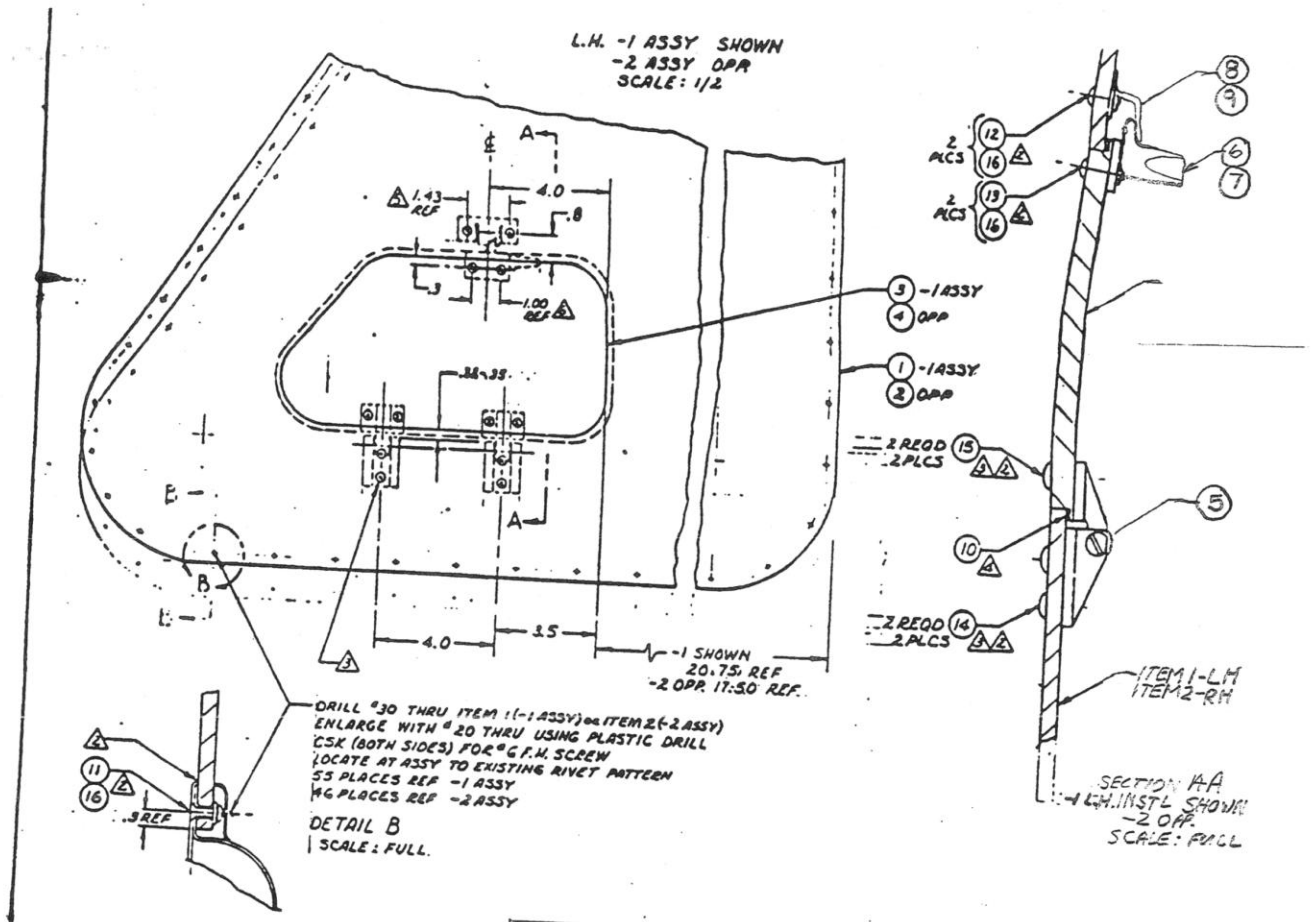
DWG. NO. DLB-1301

PG. 2 OF 3



For Detailed Inst'l
See Sheet 3

SCALE: NONE	
INST'L FWD SIDE WINDOWS AND VENT	DWG NO DLB-1301



PG. 3 OF 3

DWG TITLE INST'L FWD SIDE WINDOW & VENT	SCALE NONE
	DWG NO DLB-1301

REVISON/CHANGE NOTICE	E.O. NO. 1	DWG NO B 1301
DWG TITLE INST'L FWD SIDE WINDOW & VENT	DATE 3-21-74	

SHT 2

TO 4/M - SHT 1
ADD DECAL
PT NO. B-1315

TO NOTES

ADD: SURFACE MISMATCH OF VENT TO WINDOW .03 MAX AT ANY EDGE WHEN LATCHED CLOSE. EDGE MISMATCH NOT TO EXCEED .06 & VENT WINDOW TO MOVE FREE (NOT BINDING)

DECAL B-1315-1 (CUT FROM B DECAL ASSY) & MOUNT ADJACENT TO ALT. SOURCE VALVE SO AS TO BE CLEARLY VISIBLE.

BERYL AVIATION SPECIALTIES, INC.
LEESBURG, FLA. VAN NUYS, CA.
APPD

REVISION/CHANGE NOTICE	E.O. NO. 1	EFF. B-1301
DWG TITLE INST'L-FWD-SIDE WINDOW & VENT	DATE 3-14-74	

REVISE DETAIL B (SHT 3)
DIM. WAS .3 REF

15 1xD MIN EDGE DISTANCE TYP EXCEPT A MAXIMUM OF TWO (2) ADJACENT HOLES SEPARATED BY A MIN. OF TWO (2) HOLES (PER EDGE) MAY RUN OUT.

BERYL AVIATION SPECIALTIES, INC.
LEESBURG, FLA. VAN NUYS, CA.
APPD