

MOONEY AIRCRAFT CORPORATION
LOUIS SCHREINER FIELD
KERRVILLE, TX 78028



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ENGINEERING DESIGN

SERVICE BULLETIN M20-271
ISSUE DATE: 1 June, 1999
Revision B, 1 August, 2000

SUBJECT: Mooney M20K, ENCORE, carbon fiber cowl modification to decrease flexure of top cowling.
Revision A - To add 020271-9000 Stainless Steel Shim to Kit Bill of Material.
Revision B - To clarify resins to be used in retrofit laminating/bonding process & to specify an alternate Stainless Steel material.

MODELS/S/N
AFFECTED: M20K, S/N 25-2014 thru 25-2032 (as shown on Figure M20-271-1)

TIME OF
COMPLIANCE: At owners convenience.

INTRODUCTION: Some M20K ENCORE's with carbon fiber cowling have exhibited loose rivets around the Oil Filler Door area. Engineering evaluation has determined that under certain situations excessive flexing of the top cowling during Oil Door opening and closing may be encountered. The force in completing this action could cause top cowl flexure and in some cases rivets to loosen. The modification of the top cowling, per this SB, will provide reinforcement of these areas.

INSTRUCTIONS: --- TOP COWLING REINFORCEMENT: ---
1. Remove top cowling per M20K S & M manual, SECTION 71-11-01,
2. With cowling upside down on a clean, padded work area, proceed to clean existing paint from area to be reinforced (See Figure SB M20-271-1) by using MEK as paint remover.

NOTE

It is recommended that the movement to remove this heat reflecting paint be done by wiping from the center line of the area to be reinforced, outward until all paint is removed for approximately 2.5 inches on each side of laminating center line.

3. Lightly sand cleaned areas of carbon fiber cowl to provide some "tooth" for laminates. Wipe sanded area with MEK and wipe dry with clean cloth prior to the MEK evaporating.
4. When areas are clean & dry, layout area to be laminated in accordance with Figure SB M20-271-1 illustration.
4. Cut/form/ shape Klegecell laminate strips to fit areas at butt joints care fully in order to provide a good bond when using either Vinylester or Marine Polyester Resin *** as the bonding agent.
5. Prepare E-glass laminates at same time Klegecell laminates are prepared. They will all be bonded during the same time frame. Prepare any special cuts for E-glass overlays at the intersections of Klegecell 90° butt joints. It is recommended that all the laminate material be cut and positioned in a dry run to assure shape and sizes are correct.
6. Bond Klegecell laminates to the cleaned area of top cowling underside. Keep cowl area on each side of Klegecell laminates clean and smooth for E-glass laminates that are to be applied at the same time. Use Vinylester or Marine Polyester Resin *** as the laminating agent.
7. Work E-glass smooth and squeegee out excess resin from E-glass laminations. Do not squeegee resin too thin.
8. Let cure in accordance with resin manufacturer process & procedures information.

--- OIL FILLER DOOR HINGE SHIM MODIFICATION: ---

NOTE

Matching exterior paint will be required to complete this modification effort. Since each aircraft is different, it is the shops responsibility to advise Mooney Service Parts of the color paint required to repaint top cowling.

1. Place cowling upside down on a clean, padded work area.
2. Remove paint in area where 020271-9000 Shim will be added (ref. Figure SB M20-271-2)
3. Align hinges on -9000 shim (ref. Figure SB M20-271-2) and match drill pilot holes to existing hinge holes with #21 drill (6 plcs).
4. Cleco hinges & shim in place on cowling with oil filler door closed and latched.

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5. Drill reaming holes (3 plcs) with #30 drill through pilot holes in -9000 shim and cowling top. Back up top side of cowling at each hole with a wooden drill block to keep from delaminating top side of cowling.
6. Remove shim and hinges to clean work area with MEK (or equivalent) prior to the bonding process.
7. Bond -9000 SHIM to inside cowl with EA934NA (HYSOL)*** or equivalent.
8. Clamp SHIM (in proper alignment) until cured or install rivets through hinges, shim and cowling while bonding agent is "WET".

--- COMPLETION ACTION FOR BOTH reinforcement AREAS: ---

1. When laminations are cured, repaint modified area with heat reflective silver paint, Sherwin-Williams # B59S8.
2. Apply matching exterior paint to top cowling.
3. Install completed top cowling per SECTION 71-12-02 of S & M manual.

WARRANTY: Mooney Aircraft Corporation will provide warranty on components and up to 8.0 hours labor for all S/N's within original warranty agreement time frame. Warranty credit will be applied to the MSC's account when the properly completed MAC Warranty Claim form is received with the MSC's invoice within 180 days of date of this Service Bulletin. Due to the nature of the materials included in shipment, MAC will pay for ground freight charges only.

REFERENCE
 DATA:

N/A

PARTS LIST: Kit No. 020271-001 -- Carbon Fiber Cowl Modification, M20K

ITEM	P/N	DESCRIPTION	QTY
1.	4 lb/ft ³	KLEGECELL *, 30 in. X 6 in. X 1/2 in. thk.	1
2.	7781	E-GLASS, 38 in. X 30 in.	1
3.	MS20427M4-4	RIVET, MONEL	3
4.	MS20427M5-6	RIVET, MONEL	6
5.	**	PAINT, EXTERIOR (SHERWIN-WILLIAMS)	1 qt.
6.	EA934NA	ADHESIVE, HYSOL ***	8 oz.
7.	B59S8	PAINT, REFLECTIVE (S-W)	1 pt.
8.	020271-9000	SHIM ****	1

* CUT KLEGECELL TO SIZE AND SHAPE FOR EACH LAMINATE AREA.

** SEE AIRCRAFT LOG BOOK ENTRY FOR BASE COLOR PAINT NUMBER. ADVISE MAC SERVICE PARTS OF PAINT NUMBER REQUIRED WHEN ORDER IS PLACED FOR KIT.

***Hysol adhesive is an epoxy adhesive. Epoxy Resins and adhesives will bond to carbon fiber material initially, however, experience has shown that the epoxy may delaminate at some later period of time. Therefore, it is recommended that either Vinylester (Dow Derakane 8084) or a Marine Polyester resin be used when bonding a laminated layup to any carbon fiber material. Neither the Vinylester nor the Marine Polyester will be sent along with the kit, due to the availability of polyester resins.

****Either #321 S/S or #301 S/S may be used to make the 020271-9000 SHIM.

FIGURES/
 TABLES:

SEE FOLLOWING PAGES.

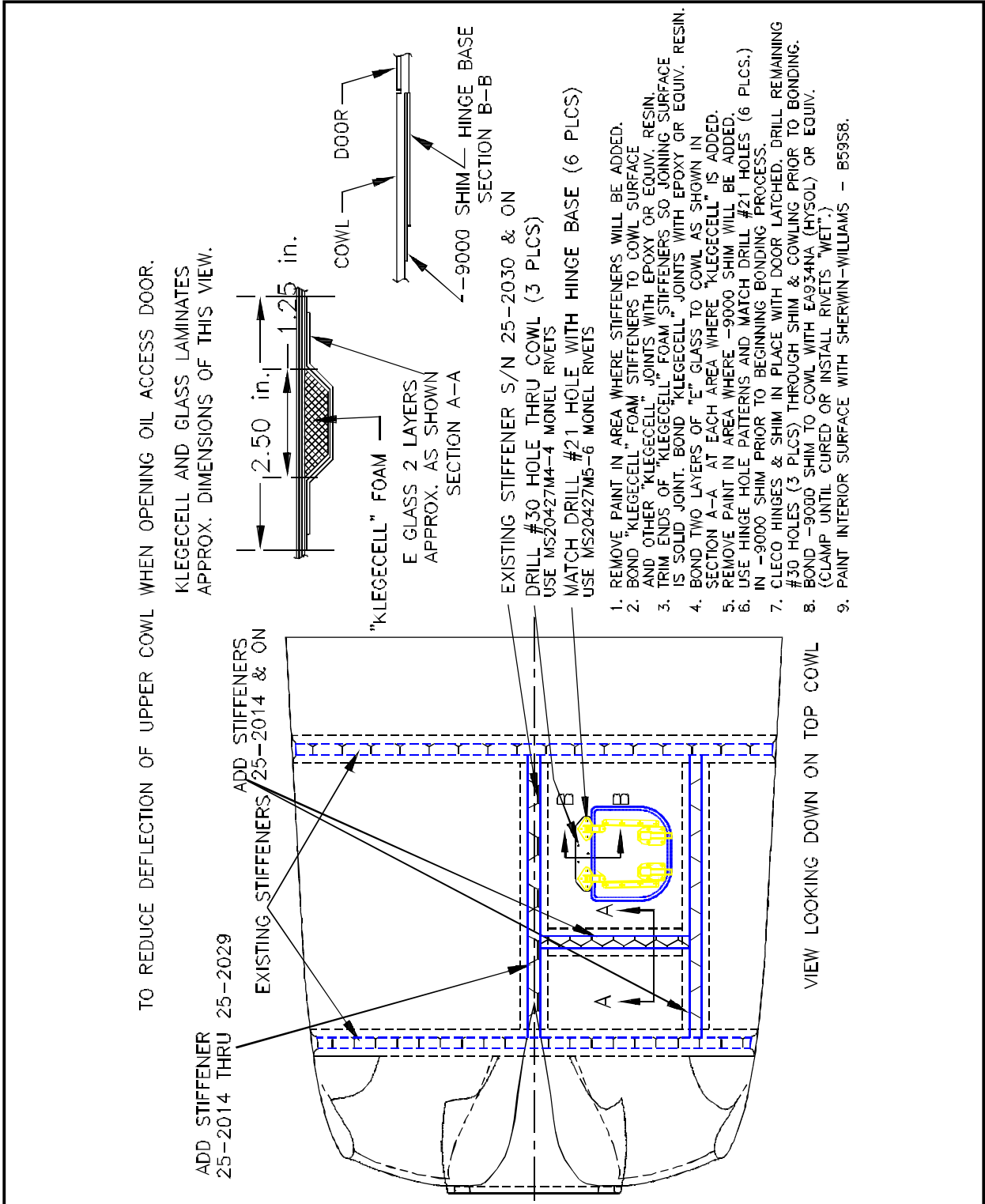


FIGURE SB M20-271-1

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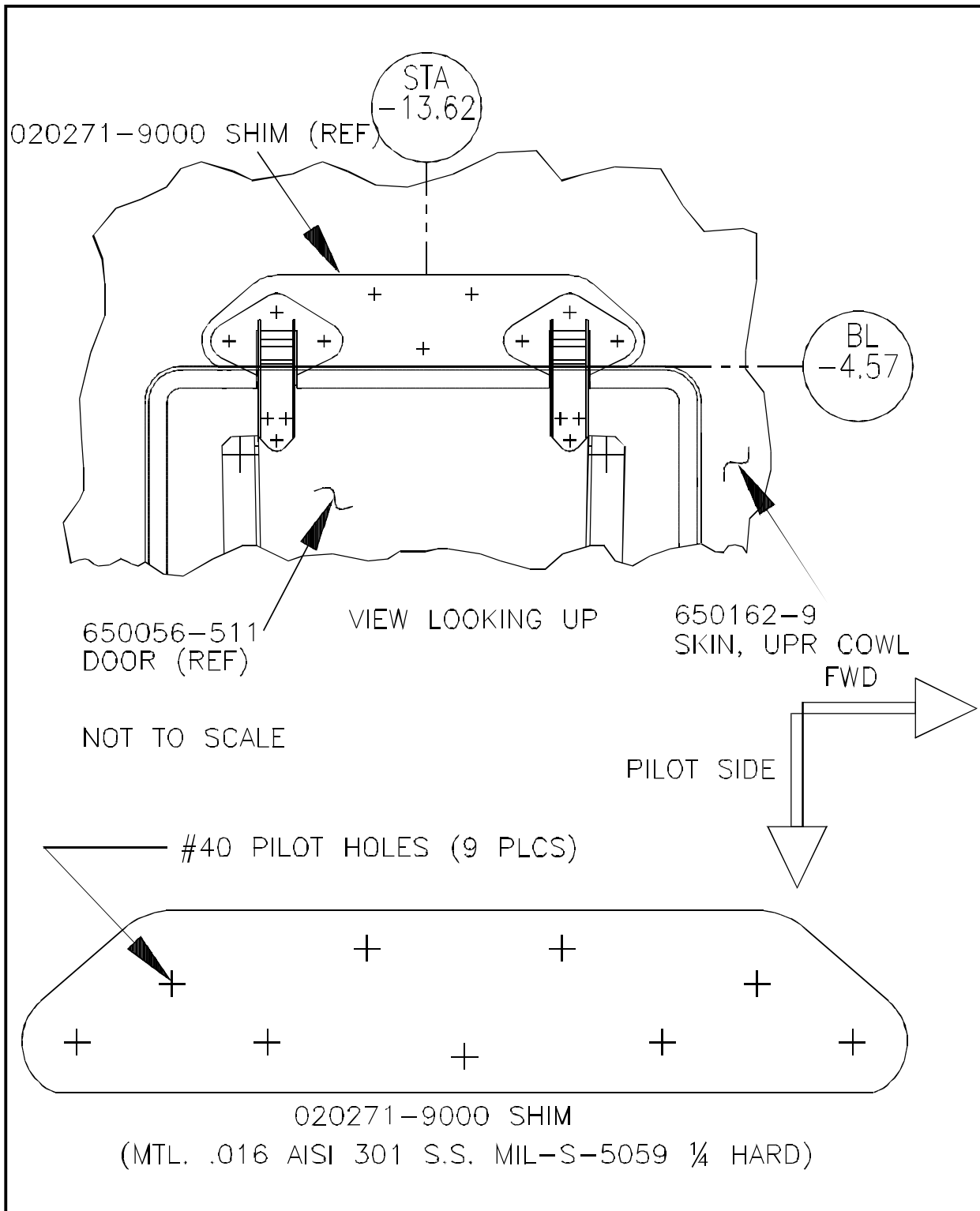


FIGURE SB M20-271-2