

FITTING A SPATIAL INTERIOR

The Spatial Interior is a series of practical molded and flat plastic panels designed to replace original foot, arm, and baggage side pieces in the vintage Mooney. Overlapping from front to back and secured with recloseable fasteners, one panel holds another. Areas below window trim are transformed in a very short time.

Tools and materials

Aviation nippers, Dremel tool with grinding and sanding bits, drill, pencil and Sharpee pen, denatured alcohol, coarse sanding paper, wallpaper seam roller, duct tape and cleaning cloths.

Plastic repair

- Original window trim, hat rack forward panel and headliner pieces are to be removed, reconditioned and finished with coordinating colors or fabrics. Suggest using a plastic box to hold all removed screws and hardware. Use a plastic bag to hold seat belt hardware. Due to extent of wires, air ducts and magnitude of headliners with eyeball air vents, these may best be reconditioned in place. Repair methods are reviewed in a separate document.



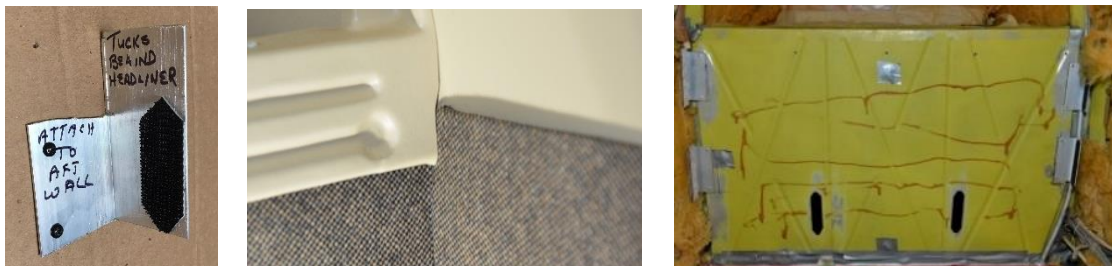
- Those models with one-piece window and arm area plastics, to include the cabin door, are to be cut below the window trim. See photos. Note the trim line in the center photo that accommodates a molded area on some models.

Make certain

- This entire manual is reviewed, and any questions are answered prior to starting installation. Suggest documenting overhead light wiring with iPhone photos before disassembly. Spatial panels are positioned with enough overlap to hide recloseable fasteners and panel molded recessed areas that are no longer used.

Baggage area corners

- Four angle aluminum corners with recloseable fasteners and bonding tape are provided. Before removing hat rack plastics and headliner, position upper corners approximately 1 inch below lower edge of hat rack forward panel with the modified upper right corner touching against back side of the headliner. This bracket results in a perfect fit of a reconditioned headliner. See attached photo. Mounting tape enables perfect temporary placement. Permanently install all



corners using 7/64th inch drill bit and #6 sheet metal screws. Photo shows suggested recloseable fastener locations to secure aft panel. **The lower five screw holes in the forward hat rack panel are to be filled enabling the aft baggage panel to be easily secured by slipping underneath. Secured with two dual lock assemblies the panel is positioned to rest on top of floor carpet.**

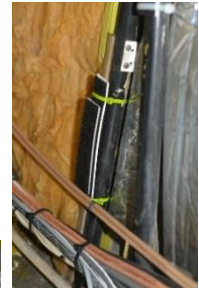
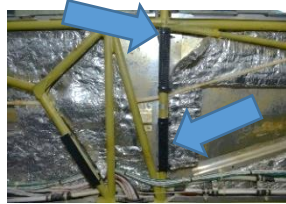
Kick panel plates

- Remove original kick panel attaching plates. If unable to access the forward clamp, cut the plate with an aviation nipper and bend it back totally out of the way.

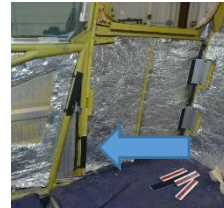
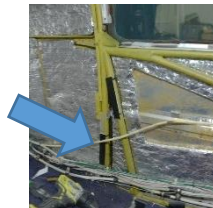


Preparing to secure panels

- Panels are held in place with minimal number of recloseable fastener assemblies provided with kit. More important than fastener length is the two parts fully engage. Every recloseable fastener mounted to the tubular structure includes ty-raps and double sided tape to secure ends and stop twisting. **Blue arrows identify the baggage area and side fastener locations that require drilling small holes in fairing for routing ty-raps.** Position pilot side baggage panel lower dual locks at a height to avoid the molded area. Depth to accommodate wire bundles may require doubled layers of dual lock material.



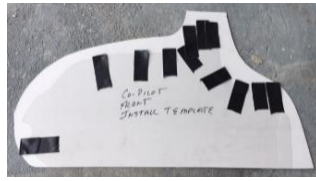
This fastener is incorrectly placed as the molded baggage panel creates a void in this spot.



Fitting spatial panels

- Fitting molded panels is completed with use of see-thru templates as shown in this right rear panel example. Secure template in position centering the recessed area markings. Use folded over duct tape ends to perfectly identify perimeter and secure in place on template. Upper alignment marks on three seating positions assure symmetrical recessed areas. **Assure spar corners are perfectly identified.**
- Start installations with footwells. Secure templates with duct tape in positions that place both pilot and co-pilot foot panels as far forward as possible assuring no rudder pedal interference. **Be sure to place high enough to create room for floor carpet.** Template front edge duplicates Spatial panel for ease of fitting. Identify areas to be trimmed for wire bundles and hoses. If possible, secure behind the instrument panel and headset jacks. Any tab that can slip beside the instrument panel will help hold it in place. Identify vent and for some models, emergency gear control locations. Use removable vent ring to mark opening for cutting.





- Mark on template the center of vents and emergency gear controls as needed for creating small openings on new panels. Precise cutting of these openings to be completed with Dremel bits after initial fitting. Openings are covered with pivoting doors fabricated from plastic trimmings and secured with #8 screws, washers and lock nuts.



- ***Make certain adjoining panels have length to overlap recloseable fasteners and recessed areas no longer used.*** Identify perimeter edges with folded over duct tape as shown on this pilot side template. Note that molded areas in forward foot panels have been removed. Transfer completed template to new panel and align edges or recessions with molded panels. Mark perimeter with pencil and cut. Better to cut twice, rather than too short. Allow height from floor to easily accommodate carpet thickness. Both footwell panel lower aft corners are to be trimmed to allow slipping past the floor bracket. First fit with panel located behind the floor bracket, then mark and trim to allow it to slip past. Overlapping pilot and door jamb panels are trimmed to a length extending to the end of that same floor bracket. Pilot and door jamb panels are to slip behind this same floor bracket. Trim as needed to accommodate aileron control rods.



- Upper edges are placed 2/3rd the way up on the airframe tube. ***Note template alignment marks intended to parallel the window frame, creating symmetrical positions of the three seating panel recessed areas. If possible, pilot side panel is trimmed to slip beside the instrument panel.*** If not completely, even a portion of the Spatial panel slipping behind the instrument panel is helpful. Make certain all underlapping edge fastener cutouts cover a cabin structural tube like the one indicated with the blue arrow. ***Pilot and co-pilot forward panels are trimmed to slip by rather than behind the floor bracket in the area indicated by the red arrow.*** Thick wire bundles often found near the blue arrow may require doubling the dual lock to easily engage.



- Black duct tape works well to finish the floor bracket. Cleaning the bracket, floor and track is easily completed with a drill and wire brush. Prep with alcohol.



Apply mating recloseable fasteners

- ***On new panels, scuff dual lock mounting areas with coarse sandpaper and clean with alcohol.*** Lightly engage mating dual lock to the tube attached assembly and remove backing. Put panel

temporarily in place and gently transfer fastener to the new panel. Remove panel to permanently secure dual lock. Protect dual lock mushroom heads by placing non-adhesive dual lock over installed strip. **Secure adhesive by pressing with wall paper roller or equivalent.** Remove protective dual lock and proceed to next strip. Note the pointed dual lock end is created to ease separation for panel removal.



Optional forward panel fabric covering

- This option covers sharp edges while creating elegance.



Door jamb

- Cabin door jamb panel is trimmed for fitting beneath the door sill while overlapping the foot panel and touching the spar. No dual lock assemblies are required as it is held in place with the floor bracket and door sill. No template is required for this panel.

Rear seat panels

- For symmetry, rear seat panels are best fitted simultaneously. Position templates providing clearance for recessed areas while paralleling the alignment marks with windowsills for symmetry. **Carefully mark and trim the spar corners as they become installation contact points.** Note the blue arrow.



For some models, a slot will be required to slip past the upper seat attachment bracket. Align and cut this slot visually with panel in place after initial trimming. This enables removal and reinstallation without removing seat back hardware. Leave adequate space for lock nut. Panel contact at this point should be simultaneous with the spar corner.



- Make certain any overlapping pieces hide unused panel recessions and dual lock fasteners.** Seat adjustment handles can be treated in the same manner as described for emergency gear controls by covering and later creating openings. See blue arrow.



- An included two-part cardboard template works well for fitting the aft baggage panel. To eliminate any corner void, trim sides to extend slightly between the attachment corners. Once each template side is trimmed, align and mark the overlap joint and transfer the completed template to the new panel. Leave room for fabric covering. Mark perimeter and cut for a perfect result. Side baggage panels are visually trimmed to fit, assuring the overlap joint is covered. Trim forward edge to a pleasing line allowing adequate space for the seat back retaining bolt and nut.



- Side baggage panels to be trimmed without templates. Trim co-pilot side panel to cover any possible voids around the baggage door sill. **For a pleasing look, align pilot side panel top to visually parallel the baggage door sill as shown.** Note the blue arrows.



- Baggage panels to be covered with optional fabric, matching the foot area and spar.



Spar panel install

- Trim the spar panel to a height that extends to bottom of the upper spar cap. This location provides a slight recessed fit that works well with the seat upholstery flap. For models with the plastic seat tray, spar panel height needs to extend to top of the tray. Latest install technique uses the four original screw holes located adjacent to the upholstery rod clips in models with the one-piece lower seat cushion. These screw locations will not interfere with upholstery or rectangular storage pockets. After trimming the spar panel to the desired height, fit and trim the sides with the provided cardboard templates exactly as with the aft baggage panel. **Press template gently against the side panel to assure any back-side void does not result in a poorly fitted corner.** Mark and trim the new panel. Place the trimmed panel in position fitting it behind the 90-degree floor tabs. Lower edge to be trimmed to accommodate varying spar cap heights.



With panel in place and use of pointed tool or pen, mark one screw location to back side of the spar panel. With 7/64th inch drill bit, create screw opening and lightly attach panel to the spar. Complete this same process for all four screws. With screw locations now confirmed, apply provided taped shims as needed to back side of the spar panel for perfect alignment clearing the upholstery rod. With ¼ inch Dremel grinding stone or drill create spar panel openings through panel and shims centering the original screw hole. Use of an upholstery washer covers this opening while simplifying removing and reinstalling the spar panel along with relieving any imperfect screw location.



- Spar storage pockets if installed, are to be centered between seat rails. **Use screws and washers to hold top corners tight.** Do not over stretch. Hammer punch works great for creating openings through fabric and panel locations identified with provided install templates.



Cabin door panel

- Oversized door panel has latch opening in the correct spot. With Dremel grinding stone, enlarge latch shaft circular base opening to fit flush. Place panel on handle shaft and rotate to touch against the hold open arm. Trim bottom in small increments until the recessed area fits level in the door opening. **With 7/64th bit, drill screw holes in the upper corners, well beneath the overlapping upper panel and approximately ½ inch from door edge. Be sure to avoid latching hardware when drilling additional screw holes.** Slight excess door panel height and width can be removed by sanding with Dremel sanding bit until panel edge aligns with the frame. Once trimmed perfectly, drill additional screw holes as needed to secure panel. **Again, avoid the latching hardware by a wide margin and do not drill into a void. Limit number of attaching screws to ten or less.** No screws are to be placed above the hold open arm as indicated on the adjacent photo. Assure the door panel clears the door frame and closes easily. Remove the fitted door panel and finish edge with sanding paper. **Before reinstalling, prep and finish exposed door metal frame with an etching black primer finish.**



Storage pockets

- Design provides up to seven storage pocket locations. Templates enable precise positioning and marking of fastener locations. Take your time and make certain positions are right as ¼ inch holes will be created. To assure smaller side pockets are straight, window trim must be in place when marking. There is no need for a tape measure, simply position pockets for the desired look. **Do not overstretch the upper corners. Suggest placing all pockets to parallel the floor or window edge. Emergency gear crank movement can be restricted by a left front pocket which should not be installed.** For models with rear seat adjustment controls or oxygen ports, make certain pocket locations do not interfere. Placing pockets in positions where fasteners do not touch airframe tubes is also helpful. If needed, use of screws instead of standard fasteners can minimize interference. Spar pocket locations are designed to be centered between seat rails. To protect fabric, Christmas tree fastener openings can be quickly created with use of ¼ inch hammer punch. Upper corners are to be secured with provided #4 machine screws, flat washers and lock nuts.



Finish color and design

- Finishing panels with selected colors has been completed with use of SEM, Dupli-Color and Bulldog products. Aerosols include cleaners, adhesion promoter, texture as needed for plastic repair areas, colors and multiple clear coat protective and low luster finishes. Standard ¼ inch masking tape works well for creating curved edges.

Decorative edge trim

- Flexible color coordinated silicone rubber edge trim is suggested for visible unfinished window trim and overlapping panel edges that do not overlap fabrics.
- Cut trim to a desired length. Scuff back side of related panel edge with coarse sandpaper and clean with alcohol.
- Apply thin bead of silicone adhesive to back side of the mounting area only and smooth with finger.
- Place edge joint in the top middle of a window trim. Slip edging into place and temporarily hold with short lengths of duct or quality masking tape applied 90 degrees to the edging. Slightly stretch edging at corners to eliminate buckling. Tight outside corner buckling can be eased by trimming width of the back side and slightly stretching. Cut to length for a perfect joint. Remove duct tape after a one hour or longer cure time.



Document holder

- Document holder is fabricated from panel and template trimmings. Finish holder with desired color. Secure clear plastic window with provided acrylic tape and trim excess material from edges. Place narrow Velcro pieces on all back sides to help hold documents. Align and install document holder to rear baggage panel with 7/64th holes and #6 screws.



Arm accents enhance the appearance

- Small plastic inserts, covered with coordinating fabrics, held in place with low profile Velcro, add elegance without reducing space.
- Optional armrests when centrally placed are practical and attractive.



Cabin and baggage door sills

- Early model door sills were of short length and are typically worn. Lengths of .032 aluminum are available to replace these original parts. Cut aluminum angle with nippers to a length that extends beyond the cabin door hold open arm along the entire straight edge. Trim to accommodate the hold open arm mount. The same process is completed with the baggage door sill. Secure these sills with 7/64th inch drilled holes and #6 screws placed in areas that do not interfere with the hold open arm. Door frame blemishes from arm interference will be good places to avoid placing screws.



Cabin and baggage door windlace are typically worn

- From personal experience, I can attest that installing windlace is not easy and results can be disappointing. Attaching flange must be clear of original screws. Cut windlace cord to an adequate length. Fitting new windlace perfectly against adjacent plastic panels is critical and such panels need to be temporarily installed to make certain fit is right. To make this job easier, I discovered that an acrylic transfer tape applied directly to the windlace and then to the flange in the perfect position dramatically simplified installs. Nipping the corners as little as possible enables surrounding without buckling. Once held temporarily in place with tape, thin washers and #4 screws are installed as needed. This requires a 3/32nd drill bit. The washers hold securely while enabling an installer to insert the screw. In case of the headliner remaining in place, windlace has been secured with #6 screws applied directly through the headliner and windlace.

Baggage door windlace is held in the same manner with exception of the area adjacent to a hold open arm and two upper corners. Needed clearance is provided by positioning the windlace even with the frame edge and secured with #6 screws and speed nuts.

Fitting windlace beneath a door sill may require removal of cord allowing it to lay flat. In this case, cutting the stitch for access to the cord is required.



Baggage door liners are often cracked

- Door panels can certainly be reconditioned and reinstalled, however, cracks due to fitting stresses will often reoccur. If your baggage door liner is cracked, an option may be replacing it with a .040 flexible flat aviation rated plastic liner. This slightly oversized panel is easily trimmed and can be held in place with minimal screws. Liner and baggage door frame finished with coordinating color creates a very pleasing look.



Early model fuel selector fairings compromise space and are often broken

- Easily installed two-part fuel selector fairing creates additional space for selecting fuel tanks.



J and K model trim wheel fairings create difficulty removing seats and handling seat belts.

- New design eliminates breaking, reduces fairing width by ½ easing seat and belt movements.



Return to service requires aircraft inspector authorization

- Required placards are provided as part of a Spatial Interior kit. Sample logbook endorsement, STC document, original installation manual, fabric burn tests and Instructions for Continued Airworthiness document will be provided for aircraft records.

For the answers to questions, contact:

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