

PIPER PA-24

ARAPAHO WINDSHIELD

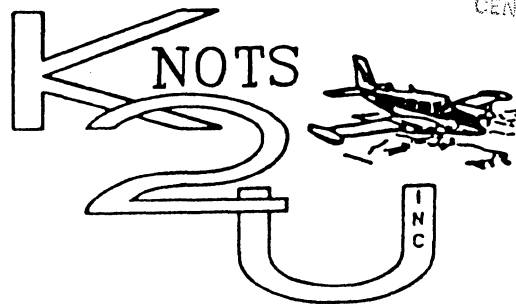
STC No. SA909GL

APPLICABLE MODELS  
PA-24, PA-24-250, PA-24-260, PA-24-400

KNOTS 2U, INC.  
ARAPAHO WINDSHIELD  
INSTALLATION MANUAL  
ISSUE DATE 06/06/84

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APPROVED

DEC 16 1994  
*S. M. Acker*  
CHICAGO AIRCRAFT  
CERTIFICATION OFFICE  
CENTRAL REGION



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REVISION PAGE

REV. No	DATE	PAGE	EFFECT
A	06/10/85	ALL	REVISED RETAINERS AND HARDWARE
B	05/15/87	ALL	VISOR & MOULDING CHANGES
C	09/30/94	ALL	REVISED RETAINERS AND INSTALLATION

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**FOREWORD*****READ CAREFULLY BEFORE STARTING INSTALLATION !!***

AFTER MORE THAN A DECADE OF PRODUCING THE "ARAPAHO" WINDSHIELD MODIFICATION FOR THE COMANCHE AIRCRAFT WE HAVE BEEN ABLE TO MAKE MANY IMPROVEMENTS IN THE INSTALLATION, AS A RESULT OF OUR ON-GOING RESEARCH AND GREAT CUSTOMER SUGGESTIONS. LISTED BELOW ARE SOME TIPS TO MAKE THIS INSTALLATION FASTER AND BETTER.

1. THE STRINGENT INSPECTION PROCEDURES AT THE FACTORY MAKE A DEFECTIVE WINDSHIELD EXTREMELY UNLIKELY. HOWEVER, IT IS IMPERATIVE THAT YOU REMOVE THE PROTECTIVE COATING AND INSPECT THE GLASS, BEFORE STARTING THE INSTALLATION. AFTER INSPECTING, RE-COVER THE GLASS, TAPING THE PROTECTIVE MATERIAL BACK IN PLACE, TO AVOID SCRATCHING DURING THE INSTALLATION. IF A DEFECT IS FOUND, NOTIFY KNOTS 2U, INC. AT ONCE AND WE WILL ARRANGE A QUICK EXCHANGE. KNOTS 2U, INC. WILL NOT HONOR LABOR CLAIMS FOR DEFECTIVE WINDSHIELDS.
2. BEVELLING THE **OUTSIDE** OF THE TRAILING EDGE AND THE **INSIDE** OF THE LEADING EDGE OF THE GLASS AIDS IN ACHIEVING A PROPER FIT.
3. IF YOU ARE INSTALLING SIDE GLASS, AT THE SAME TIME, REMOVE THE PILOT AND CABIN DOOR GLASS, BEFORE STARTING THE WINDSHIELD, TO GIVE EASIER ACCESS TO BOTH SIDES OF THE WINDSHIELD FROM OUTSIDE THE AIRCRAFT.
4. THE ORIGINAL PLASTIC MOLDINGS (VERTICAL) MAY BE A LITTLE NARROW WHEN RE-INSTALLED AND CAN BE SPREAD OUT WITH **CAREFUL** USE OF A HEAT GUN. **DO NOT OVERHEAT !**
5. SAVE A LARGE ENOUGH PIECE OF THE HEADLINER MATERIAL, CUT OFF FROM THE FRONT, TO COVER THE CENTER FIBERGLASS MOULDING. THE MOULDING MAY BE TRIMMED, AS NEEDED, FOR A PROPER FIT. A REASONABLE TRIM JOB CAN BE MADE TO LOOK QUITE ATTRACTIVE WHEN THE MATCHING HEADLINER IS PLACED OVER THE MOULDING.
6. COMPLETE AS MUCH OF THE INTERIOR WORK AS POSSIBLE BEFORE FINAL INSTALLATION OF THE WINDSHIELD TO ALLOW ACCESS FROM BOTH SIDES OF THE WINDSHIELD OPENING.

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**SECTION 1.0 REMOVAL OF EXISTING WINDSHIELD**

REFERRING TO FIGURE 1 OF DETAIL #1, REMOVE OUTER WINDSHIELD COLLAR, RETAIN COLLAR AND SCREWS FOR REINSTALLATION WITH NEW WINDSHIELD. REMOVE ALL ATTACHING HARDWARE AND TRIM, RETAIN THE 4 VISOR SUPPORTS FOR REINSTALLATION. REMOVE WINDSHIELD

**SECTION 2.0 REMOVAL OF ROOF AND SUBSTRUCTURE**

REFERRING TO FIGURES 2 AND 3 OF DETAIL #1, MARK A LINE FOR A PRELIMINARY CUT, STARTING AT A POINT 3 INCHES FORWARD OF UPPER LEFT HAND CORNER OF WINDSHIELD OPENING. CUT ROOF AND SUBSTRUCTURE AT SCRIBED LINE AND REMOVE. REMOVE REMAINING PORTION OF FRONT CHANNEL ASSEMBLY BY DRILLING OUT ATTACHING RIVETS.

**SECTION 3.0 FITTING WINDSHIELD RETAINERS**

DRILL OUT THE 9 ROUNDHEAD RIVETS IN EACH SIDE POST. PLACE LEFT SIDE RETAINER *P/N LWSR* INSIDE OF LEFT BULKHEAD WITH AFT EDGE FIRMLY AGAINST BULKHEAD. MARK THE RETAINER WITH THE LOCATIONS WHERE THE ROUNDHEAD RIVETS WERE JUST REMOVED. REMOVE THE RETAINER AND DRILL #21 HOLES AT THE MARKED LOCATIONS. PLACE *P/N CWSR* WINDSHIELD CORNER RETAINER APPROXIMATELY 2 AND 3/8" ABOVE SIDE RETAINER USING PILOT HOLE IN *P/N CWSR* MARK LOCATION ON ROOF AND DRILL HOLE TO #21 HOLE SIZE. PLACE NEXT RETAINER 1 & 7/8" (NOMINAL) ABOVE FIRST AND REPEAT PROCESS. *P/N CWSR* SHOULD GO **BETWEEN** STIFFENER RIDGES. REPEAT THE FOREGOING PROCEDURES ON RIGHT SIDE.

**SECTION 4.0 FITTING L/H AND R/H SIDE TRIM STRIPS.**

LOCATE *P/N 30WTL* ALONG LEFT SIDE POST HOLDING TRAILING EDGE EVEN WITH AFT EDGE OF ORIGINAL SIDE POST. EXCESS LENGTH SHOULD BE TRIMMED OFF TOP AND BOTTOM EDGES. LOCATE AND DRILL (9) #21 HOLES IN *P/N 30WTL* TO MATCH 9 PREVIOUSLY DRILLED HOLES. PLACE *P/N 30WTR* IN PLACE OVER RIGHT SIDE POST WITH TRAILING EDGE EVEN WITH LEADING EDGE OF DOOR FRAME. REPEAT DRILLING PROCESS. INSTALL *P/N AN526-632-R8* SCREWS, *P/N AN 960-6* WASHERS AND *P/N AN365-632* NUTS **LOOSELY** TO SECURE ALL RETAINERS AND SIDE STRIPS THROUGH NUMBER THE #21 HOLES.

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**SECTION 5.0 MARKING AND FINAL CUTTING OF ROOF LINE**

**WARNING: TAKE EXTREME CARE MEASURING AND CUTTING FINAL LINE!** REFERRING TO SECTION A-A OF DETAIL #2. SCRIBE A LINE ON THE ROOF 2 AND 1/4" AHEAD OF THE CENTER OF THE RIVET ROW SECURING SKIN TO BULKHEAD. ALINE ENDS OF LINE EVEN WITH LEADING EDGES OF *P/N WTL* AND *P/N WTR*. CAREFULLY TRIM REMAINING ROOF BACK TO FINAL ROOF LINE. FILE AND DEBURR FINAL ROOF LINE. BREAK LEADING EDGE AS SHOWN IN SECTION A-A OF DETAIL #2

**SECTION 6.0 FITTING OF WINDSHIELD**

REMOVE PROTECTIVE COATING FROM GLASS AND INSPECT CAREFULLY BEFORE FITTING. ANY DEFECT OR DAMAGE MUST BE REPORTED TO US AT ONCE. THE GLASS MANUFACTURER WILL NOT HONOR DEFECT CLAIMS **AFTER** THE INSTALLATION. CLEAN AND INSPECT WINDSHIELD AREA TO BE FREE OF SHAVINGS AND FOREIGN MATERIAL. INSTALL WINDSHIELD IN PLACE. REFERRING TO SECTION A-A OF DETAIL #2. VERIFY PROPER FIT OF TRAILING EDGE AGAINST RETAINERS AND TIGHTNESS OF WINDSHIELD AGAINST SKIN. EDGES MAY BE BEVELED TO MAKE FIT EASIER. HOMOSOTE BLOCKS CAN BE USED TO HOLD WINDSHIELD TIGHT TO UPPER SKIN AND CORNERS. TEMPORARILY INSTALL OUTER COLLAR TO ASSURE PROPER FIT.

**SECTION 7.0 FINAL CLEAN UP**

REMOVE OUTER COLLAR AND WINDSHIELD. CLEAN CHANNEL WITH ALCOHOL OR SUITABLE CLEANER.

**SECTION 8.0 FINAL INSTALLATION OF WINDSHIELD**

MIX **SEALPAK** PER DIRECTIONS ON CONTAINER, OBSERVING SHELF LIFE. APPLY GENEROUSLY TO AREA BETWEEN SKIN AND RETAINERS FILLING ALL VOIDS AND GAPS. APPLY A SMOOTH BEAD ALONG ROOF LINE IN AREAS BETWEEN THE RETAINERS. INSTALL WINDSHIELD AND SNUG UP RETAINER SCREWS. APPLY **SEALPAK** BETWEEN WINDSHIELD AND OUTER COLLAR. PRESS **SEALPAK** INTO ANY GAPS OR VOIDS, PARTICULARLY ALONG ROOF LINE. TIGHTEN ALL SCREWS IN RETAINERS, FIT ALL BLOCKS INTO PLACE TIGHTLY, AND TIGHTEN OUTSIDE COLLAR. REMOVE EXCESS SEALANT AND CLEAN WINDSHIELD WITH ALCOHOL OR NAPHTHA. NO OTHER SOLVENTS MAY BE USED ON WINDSHIELD SURFACE.

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**SECTION 9.0 INTERIOR MOULDING INSTALLATION**

REFERRING TO SECTION B-B OF DETAIL #3 PULL HEADLINER BACK AND TRIM. THE MATERIAL JUST TRIMMED SHOULD BE RETAINED TO COVER INTERIOR MOULDING P/N 30WMC-1, AFTER IT IS TRIMMED AND FITTED. INSTALL INTERIOR MOULDING. RELOCATE COMPASS AND OUTSIDE TEMPERATURE GAUGE, IF REQUIRED.

**SECTION 10.0 SUN VISOR INSTALLATION**

INSTALL SUN VISORS, PER DETAIL #4

**SECTION 11.0 PAPERWORK**

PERFORM PAPERWORK (337 FORM AND LOGBOOK ENTRIES). PLACE KNOTS 2U, INC. MAINTENANCE MANUAL AND SUPPLEMENTAL TYPE CERTIFICATE (STC) WITH LOGBOOKS.

**WEIGHT AND BALANCE**

HARDWARE (VISORS, RETAINERS AND ATTACHMENT HARDWARE) AND WINDSHIELD WEIGHT = 18.9 POUNDS / ARM= 67 INCHES

**WEIGHT CHANGE EQUALS:**

WEIGHT OF WINDSHIELD AND HARDWARE INSTALLED  
MINUS - WEIGHT OF WINDSHIELD AND COMPONENTS REMOVED

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12.0 PARTS LIST

**WINDSHIELD PARTS**

<u>PART NUMBER</u>	<u>NO. REQ</u>	<u>DESCRIPTION</u>
C23204B2	12 OZS.	SEALPAK SEALANT
AN526-632-R8	22	SCREW
AN960-6	22	WASHER
AN365-632	22	NUT
30 WTR	1	WINDSHIELD SIDE TRIM STRIP R/H
30 WTL	1	WINDSHIELD SIDE TRIM STRIP L/H
CWSR	4	CORNER WINDSHIELD RETAINER
LWSR	1	LEFT WINDSHIELD RETAINER
RWSR	1	RIGHT WINDSHIELD RETAINER
040	1	WINDSHIELD
BLOCK	8	3/4" x 3/4" x 1" HOMOSOTE BLOCKS

**VISOR PARTS**

<u>PART NUMBER</u>	<u>NO. REQ</u>	<u>DESCRIPTION</u>
A6-106	4	RIVNUT
AN526-632-R10	4	SCREW
AN526-632-R6	4	SCREW
AN960-6	4	WASHER
AN365-632	4	NUT
MS21919DG2	4	CLAMP W/O RUBBER LINER
30VIS-2	2	5.75 x 2 STEEL ROD
30VIS-1	2	ACRYLIC VISORS

**MOULDING PARTS**

<u>PART NUMBER</u>	<u>NO. REQ</u>	<u>DESCRIPTION</u>
AN507-632-R20	4	SCREW
3135-017-24A	4	WASHER
H-799	10'	CHANNEL (WAG AERO CATALOG)
30WMC-1	1	WINDSHIELD MOULDING CENTER

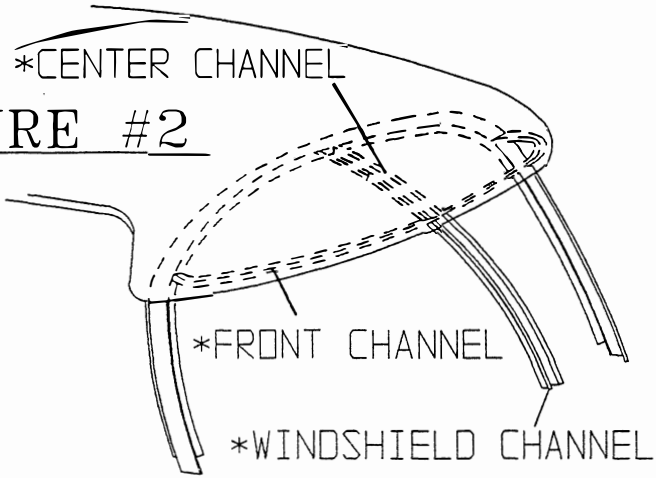
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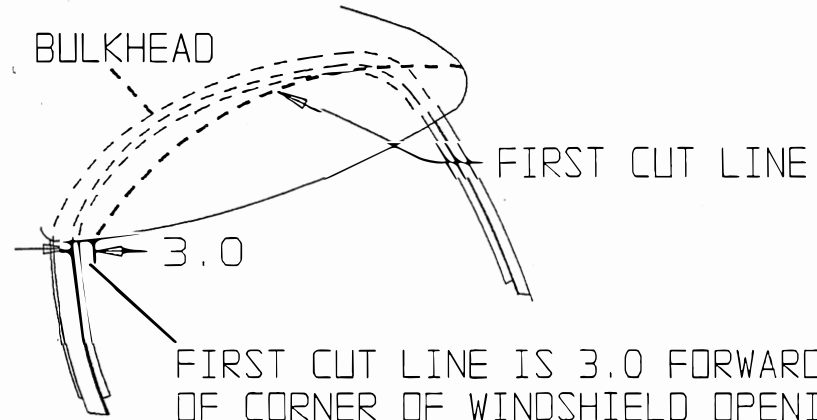
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FIGURE #2



\*FRONT, CENTER & W/SHIELD CHANNELS ARE REMOVED FOR NEW ROOFLINE



FIRST CUT LINE IS 3.0 FORWARD OF CORNER OF WINDSHIELD OPENING AND LEADING EDGE OF BULKHEAD

FIGURE #3

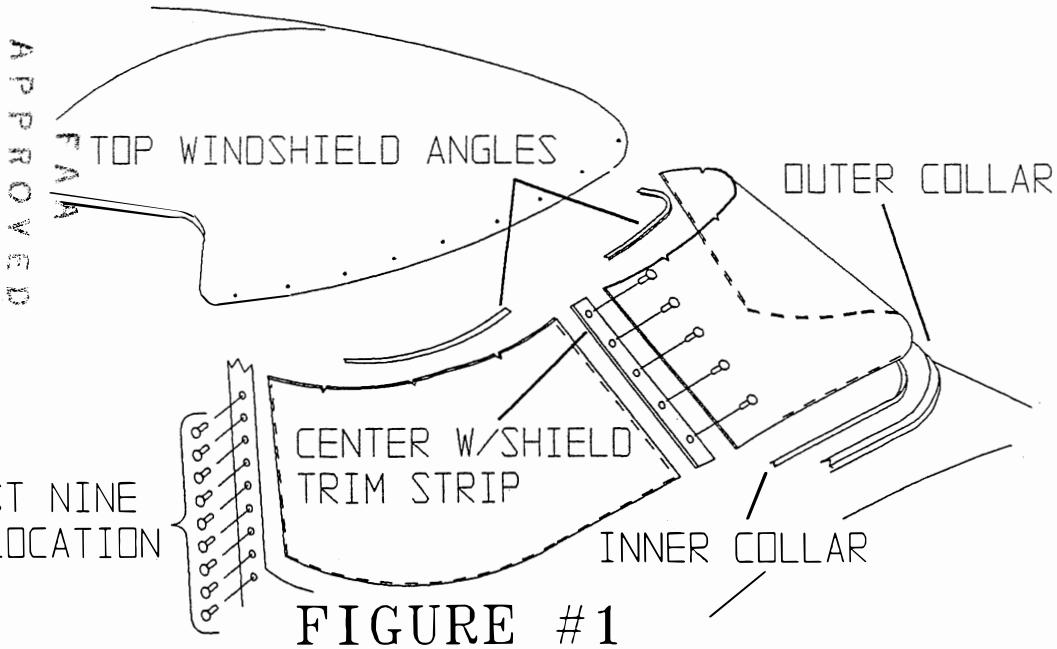


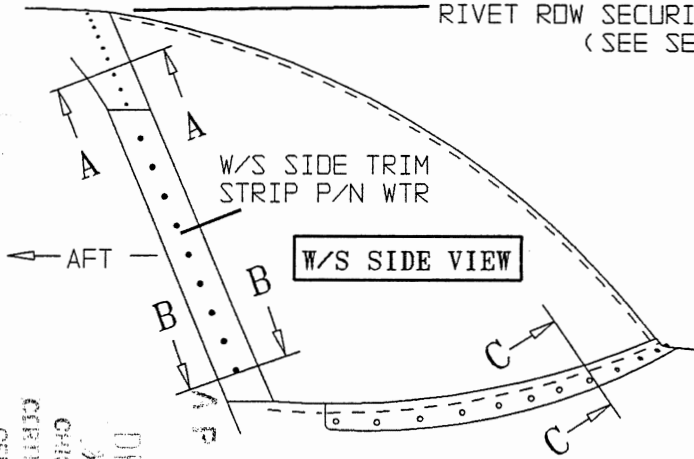
FIGURE #1

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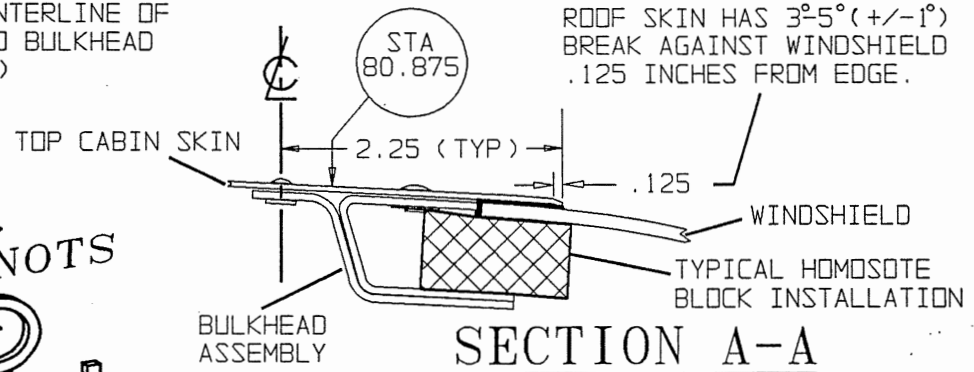
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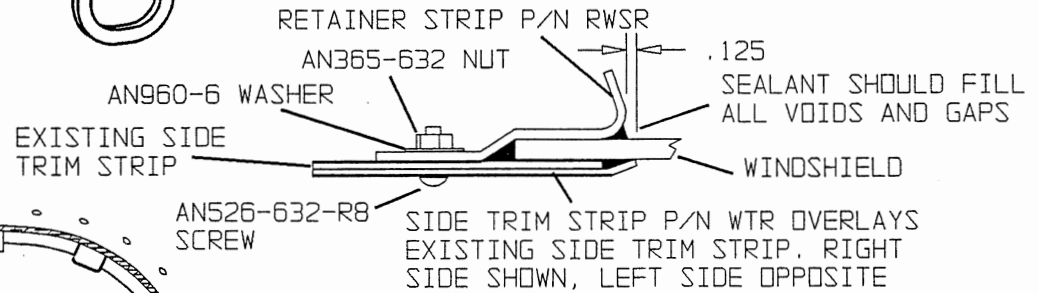
TOP FUSELAGE SKIN IS CUT BACK TO A LINE  
2.25 INCHES FORWARD OF CENTERLINE OF  
RIVET ROW SECURING SKIN TO BULKHEAD  
(SEE SECTION A-A)



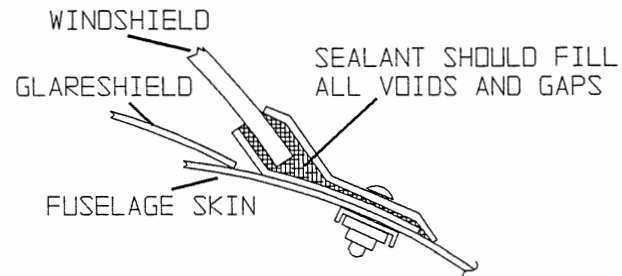
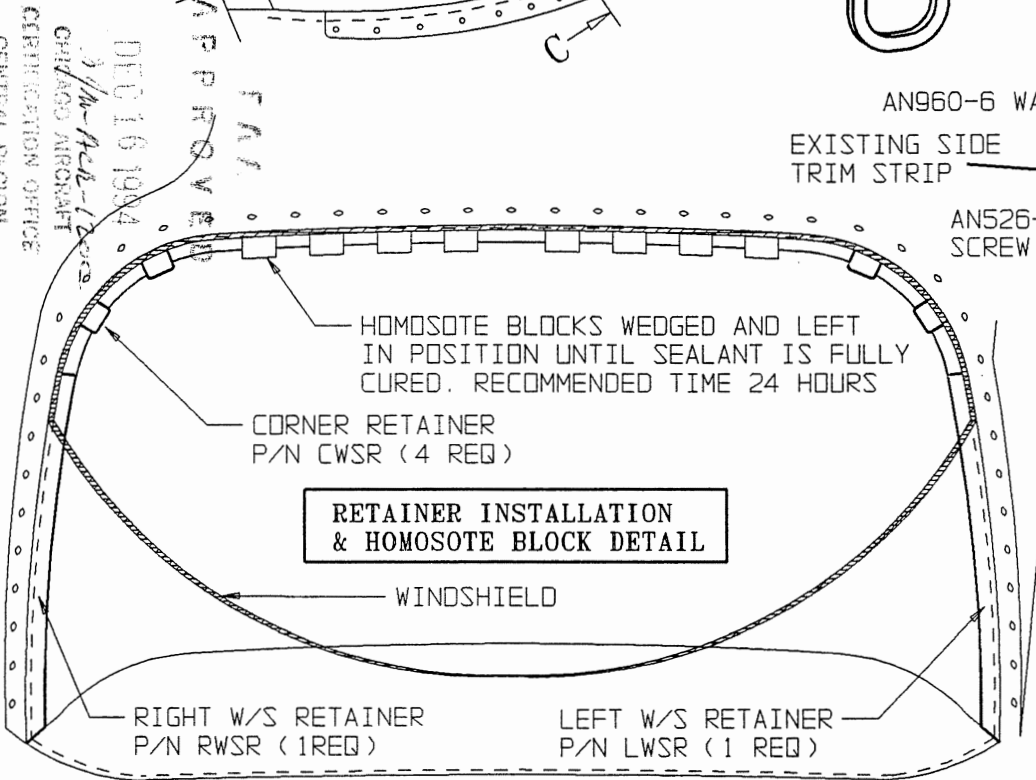
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**SECTION A-A**



**SECTION B-B**

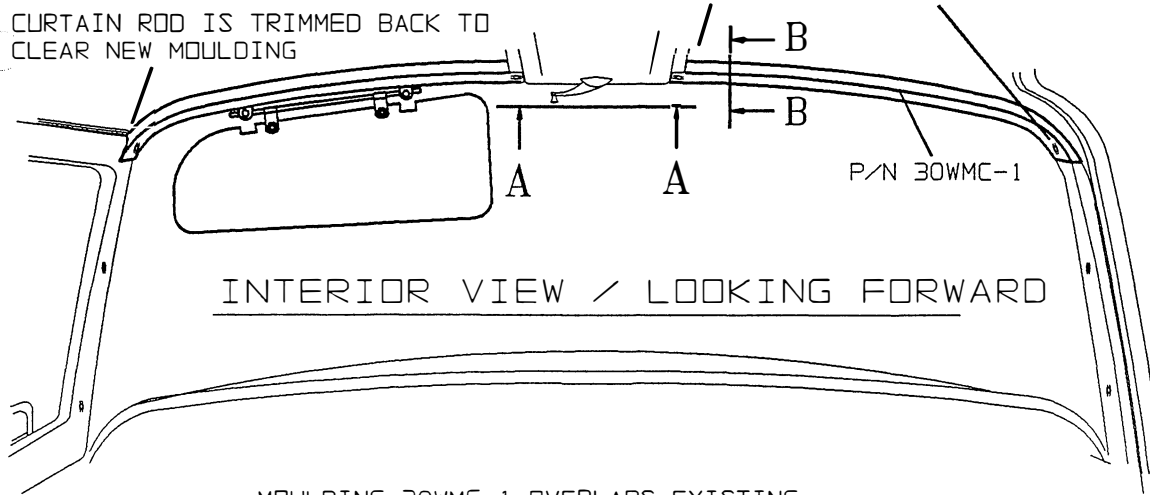


**SECTION C-C**

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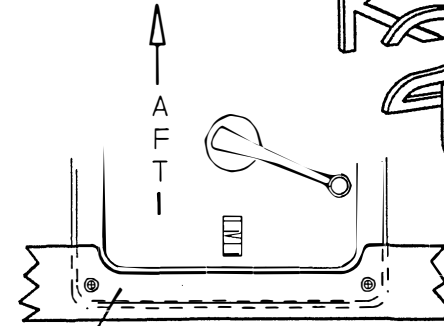
NEW MOULDING OVERLAPS EXISTING MOULDING AND IS FASTENED USING EXISTING RIVNUTS AT END LOCATIONS AND AT CABIN LIGHT PANEL

CURTAIN ROD IS TRIMMED BACK TO CLEAR NEW MOULDING



INTERIOR VIEW / LOOKING FORWARD

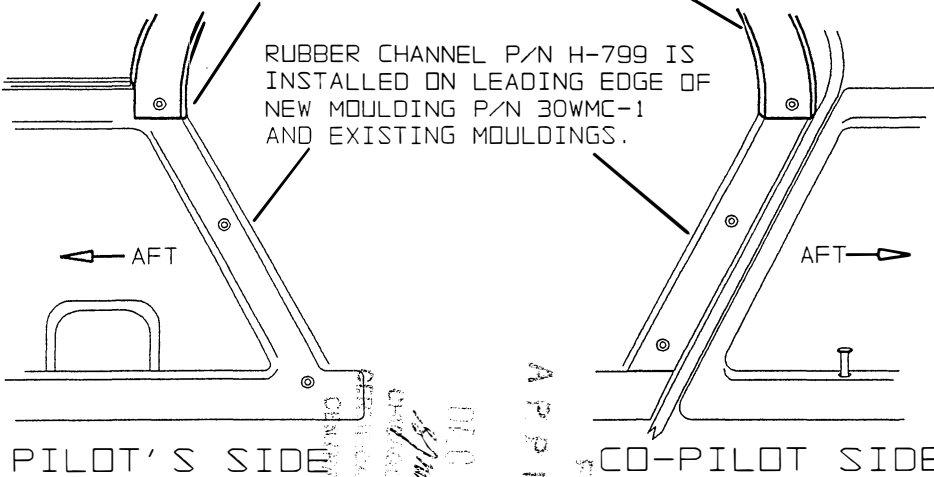
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CENTER SECTION OVERLAYS CABIN LIGHT PANEL AND IS FASTENED USING TWO AN632R10 SCREWS INTO EXISTING RIVNUTS

SECTION A-A

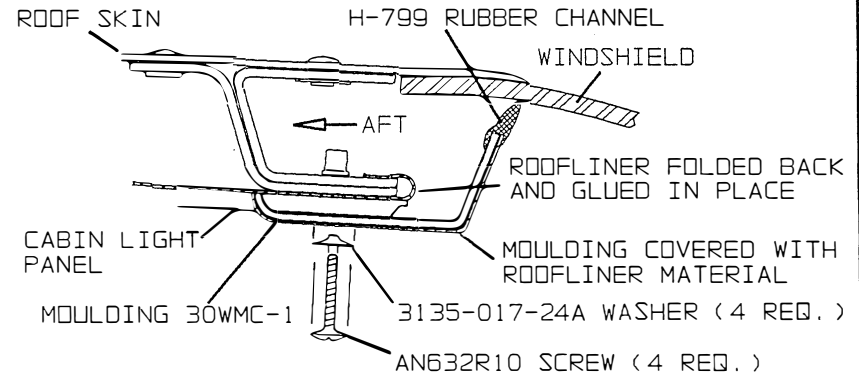
MOULDING 30WMC-1 OVERLAPS EXISTING MOULDINGS AND IS TRIMMED TO FIT AT ENDS AND AT LEADING AND TRAILING EDGES, FOR PROPER FIT.



PILOT'S SIDE

CO-PILOT SIDE

DWG. No. MOULD-1

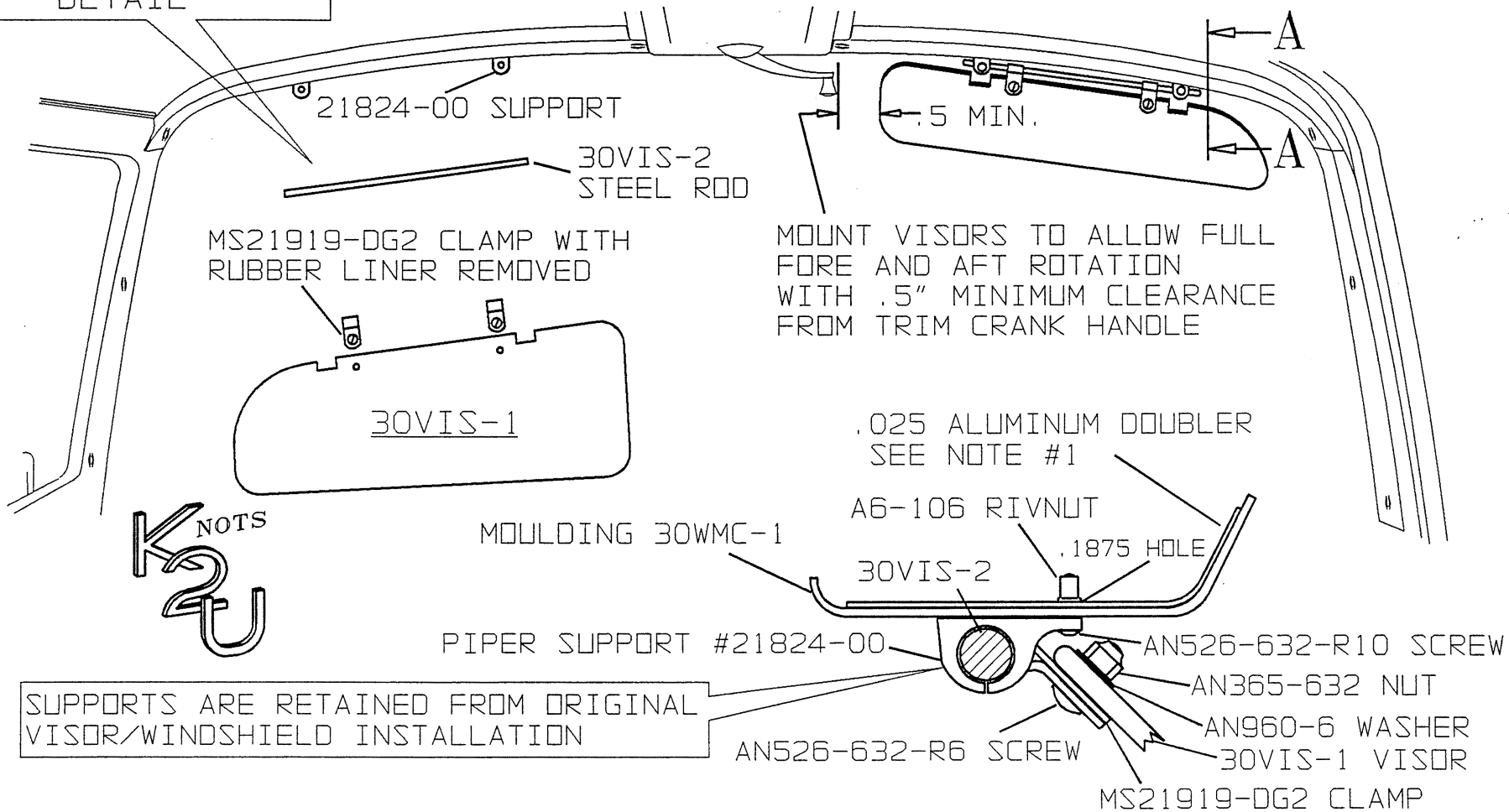


SECTION B-B

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VISOR COMPONENT  
DETAIL

INTERIOR VIEW / LOOKING FORWARD



MOUNT VISORS TO ALLOW FULL  
FORE AND AFT ROTATION  
WITH .5" MINIMUM CLEARANCE  
FROM TRIM CRANK HANDLE

.025 ALUMINUM DOUBLER  
SEE NOTE #1

A6-106 RIVNUT

.1875 HOLE

30VIS-2

AN526-632-R10 SCREW

AN365-632 NUT

AN960-6 WASHER

30VIS-1 VISOR

MS21919-DG2 CLAMP

AN526-632-R6 SCREW

MOULDING 30WMC-1

PIPER SUPPORT #21824-00

SUPPORTS ARE RETAINED FROM ORIGINAL  
VISOR/WINDSHIELD INSTALLATION

NOTE #1:  
INSTALL .025 ALUMINUM DOUBLER  
AT VISOR RIVNUT MOUNTING AREA  
AND AT CENTER OF MOULDING IF  
COMPASS IS MOUNTED TO MOULDING

DWG. No. VISOR4

SECTION A-A

DETAIL #4 PAGE -8-

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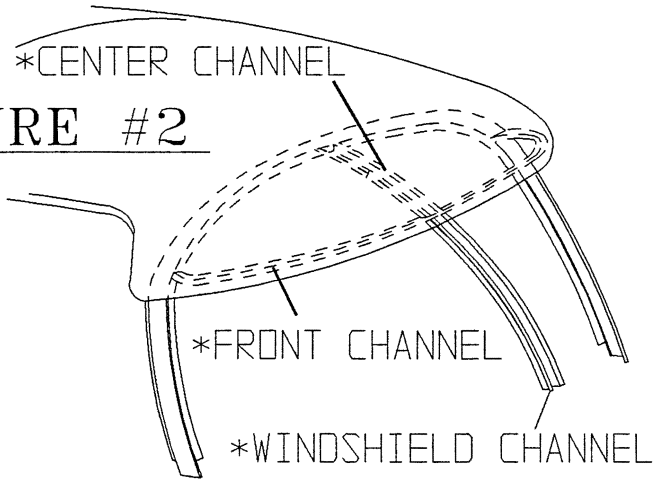
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CHIEF ACCOUNT

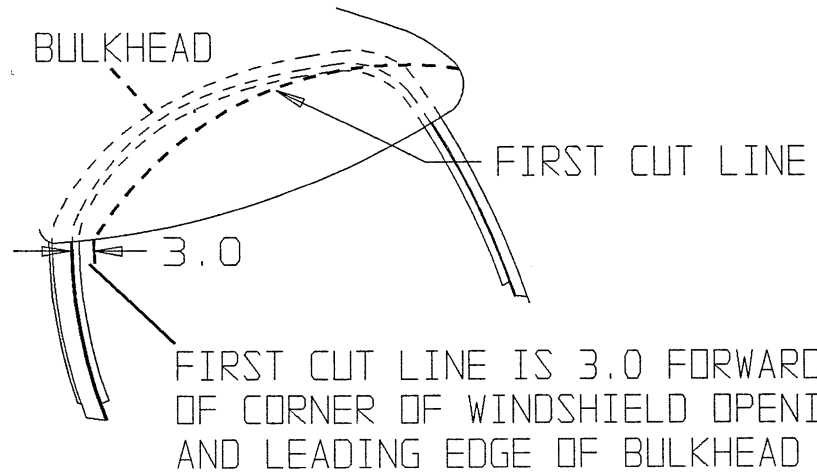
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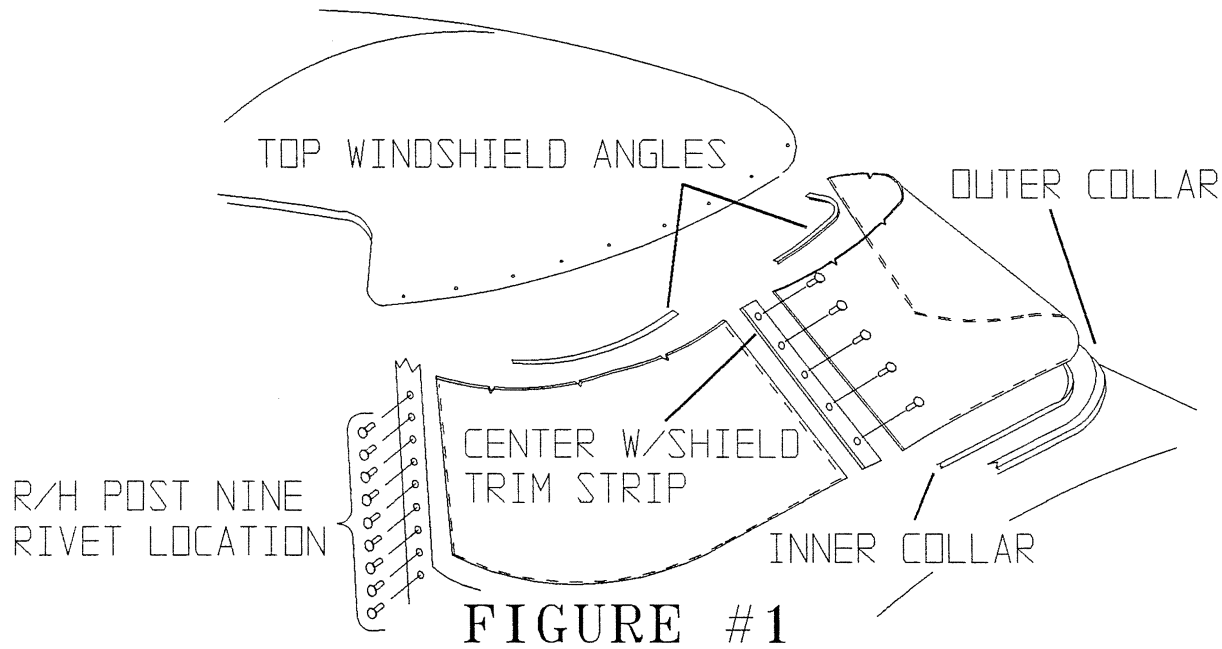
**FIGURE #2**



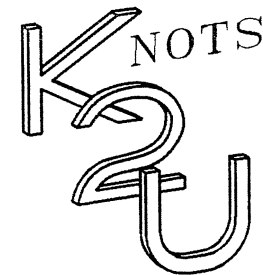
\*FRONT, CENTER & W/SHIELD CHANNELS ARE REMOVED FOR NEW ROOFLINE



**FIGURE #3**



**FIGURE #1**



SECTION 17.0 MAINTENANCE MANUAL

KNOTS 2 U. INC.

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ARAPAHO WINDSHIELD

PART A. INSPECTION

1. DAILY INSPECTION AT PRE-FLIGHT TO ENSURE THERE ARE NO CRACKS AND THAT ATTACHMENT HARDWARE IS TIGHT.

PART B. MAINTENANCE

1. WINDSHIELD MAY BE CLEANED USING SOFT MATERIAL AND LIQUID DETERGENT, ALCOHOL OR NAPHTHA. ABRASIVE COMPOUNDS AND/OR SOLVENTS SHOULD NOT BE USED.
2. FABRIC COVERS WHICH MAY ABRASE AGAINST THE SURFACE OF THE WINDSHIELD SHOULD NOT BE USED.

PART C. REPAIRS

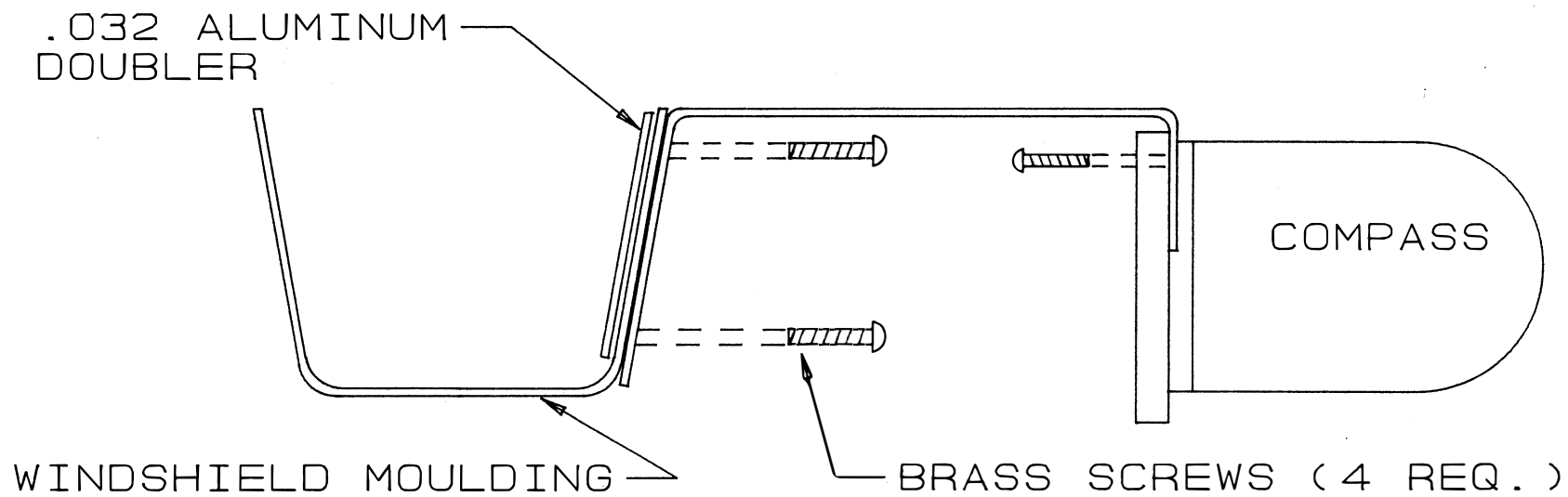
1. IF SCRATCHES OCCUR COMMERCIAL PLEXIGLASS POLISH MAY BE USED TO RESTORE THE SURFACE.
2. IF A CRACK OCCURS, IT MAY BE STOP DRILLED ACCORDING TO FAR 43.131A, ACCEPTABLE METHODS, TECHNIQUES, AND PRACTICES AIRCRAFT INSPECTION AND REPAIR, CHAPTER 9.

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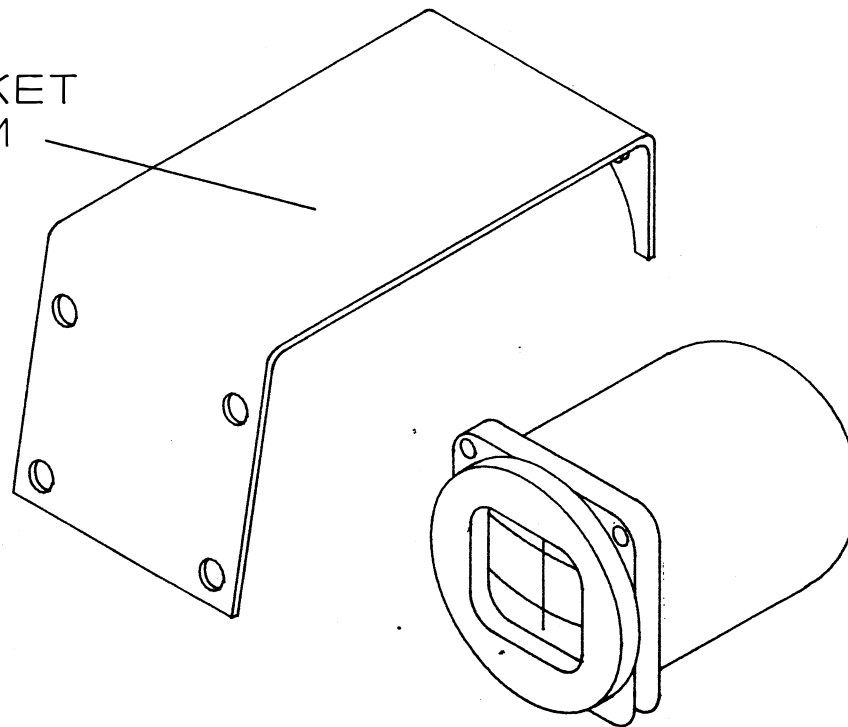
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# COMPASS ADAPTER BRACKET



COMPASS BRACKET  
.040 ALUMINUM



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