

MOONEY AIRCRAFT, INC.  
M-18 SERVICE LETTER NO. 16  
(This Service Letter is F. A. A. Approved)

DATE: October 16, 1959  
SUBJECT: General Inspection and Rework  
MODELS AFFECTED: All M-18 Series Aircraft  
TIME OF COMPLIANCE: Within the next 10 flight hours but not later than 11-15-59

INTRODUCTION:

Several cases of wood and glue joint deterioration have been reported on M-18 aircraft. Instances have been reported of cracks in the horizontal stabilizer spar and loosening of the attach blocks on this spar. It is therefore recommended that (1) care be exercised in future inspection and maintenance and, (2) that care be exercised during ground handling of the aircraft so that the horizontal stabilizer will not be damaged. In view of the findings of an investigation of a recent accident involving an M-18, it is mandatory that the following inspection and rework be accomplished.

INSPECTION:

Part A - Empennage

1. Remove and completely disassemble empennage. Remove control surfaces and hinges from fin and horizontal stabilizer. Separate fin, horizontal stabilizer and tail truss. Remove bolts thru attach blocks on horizontal stabilizer spar.
2. Inspect all bolted joints for the following items: (a) wear on bolt, (b) wear on bolt hole in fittings and lugs, (c) wear on bushing and (d) wear of bushing on fittings, lugs, and wood. Replace parts as necessary,
3. Remove all fabric from horizontal stabilizer and fin. Inspect all wood and glue joints including attachment of leading edge skin to spar for deterioration.
4. At center section of horizontal stabilizer spar inspect glue joint between attach blocks and spar for deterioration and inspect spar and blocks for cracks. Inspect fin spar for cracks at attach bolt bushings.
5. Any defective wood parts shall be replaced or repaired in accordance with Civil Aeronautics Manual 18 and/or manufacturers recommendations. When it is determined that the fin and horizontal stabilizer are in satisfactory condition, the rework shown in-Figures 1 and 2 shall be accomplished. The glue used shall be a urea-formaldehyde type such as Weldwood or Cascamite. Parts for the required rework are available at no cost. Order Kit SL18-16 from the Spare Parts Department of Mooney Aircraft, Inc.
6. When recovering make fabric continuous under four outboard hinges on horizontal stabilizer and two upper hinges on fin. See that all drain holes are located as shown in Figure 3 and that they are clear.
7. Inspect welds at rudder and elevator hinges and control horns and at all joints on tail truss for adequacy of weld and for cracks, using either of the following methods: (a) magnetic particle or X-ray inspection or (b) remove paint and primer and visually inspect welds with a 10 power glass. Parts with defective welds are to be replaced or repaired. A joint may be rewelded providing the old weld is removed and the surface thoroughly cleaned.

8. Remove upper tail truss attach fittings from rear tail cone bulkhead and inspect as described in Item 2. Inspect bulkhead front and back for cracks in area of these fittings. Inspect bulkhead for separation between web and core. Check glue joint between bulkhead and tail cone skin. Repair in accordance with M-18 Service Letter No. 17. Examine trim linkage and its attachment to the lower part of rear bulkhead for excessive play. Replace worn parts as necessary.
9. Reassemble and install empennage making sure all bolts are tight. Block airplane solidly at tail skid and inspect for empennage play as follows: (See Figure 4)
  - (a) Horizontal stabilizer - move up and down at one tip and measure at opposite tip - total allowable play 1/2 inch up and down
  - (b) Horizontal stabilizer - move fore and aft at one tip and measure, at opposite tip - total allowable play 3/4 inch fore and aft
  - (c) Fin - move fore and aft at top of leading edge and measure at bottom of rudder trailing edge - total allowable play 1/2 inch up and down

#### Part B - Fuselage (Tail Cone)

1. Inspect around steel fuselage fittings and drain holes for wood deterioration. See that all drain holes are located as shown in Figure 5 and that they are clear. Inspect all glue joints for deterioration.

#### Part C -Wing

1. Remove seat, auxiliary fuel tank, and belly access panel. Inspect ribs, skin, and both spars at lower center section and around fuselage fittings for wood and glue joint deterioration.
2. Inspect all wood and glue joints in wheel well area for deterioration. Examine both spars for cracks in area of gear attachments.
3. Inspect interior condition of wing in areas having access openings.
4. Remove aileron and inspect hinges and control horn as required for rudder and elevator in Part A, Item 7, of this Service Letter.
5. Remove wing fabric, locally in area of aileron hinges and at inboard corner, of aileron well and check condition of wood and glue joints. If evidence of deterioration is found, remove fabric further as necessary for complete examination on forward side of wing trailing edge. Check security of attachment of wing trailing edge in aileron area.
6. See that all drain holes are located as shown in Figure 6 and that they are clear.
7. Add a strip of water resistant, cloth or plastic adhesive tape at the wing to fuselage joint (both sides) from the wing leading edge to the wing trailing edge under the metal fairing strip on both sides of the airplane. This tape strip should form an angle with one leg attached to the fuselage and one to the wing in order to prevent the entry of water at this point.

#### Part D - Control Systems

1. Inspect control system (aileron, trim, rudder, and elevator) as follows:
  - (a) visually inspect all welds for cracks and adequacy of weld.
  - (b) check security of all bolted hinge and fitting attach points.

Figure 1

AN 3-20A (2)  
 AN 970-3 (2) Front Face of Spar  
 AN 960-10 (4)  
 AN 365-1032 (2)

AN 3-20A  
 AN 970-3 (2)  
 AN 960-10 (2)  
 AN 365-1032

On Assembly of Stabilizer to Fin

1301 -  
 Glue to Rear Face of Stabilizer Spar. Trim ends if Necessary to Fit Between Glue Blocks.

Rear

735-3 Gusset (Ref.)  
 Dotted for Clarity

Fin Spar (Ref.)

(Upper Surface)

Stabilizer Spar (Ref.)  
 735-1

AN 3-15A (2)  
 AN 970-3 (4)  
 AN 960-10 (2)  
 AN 365-1032 (2)

3/16 D. (2)

1-1/2 (Ref)

3/4

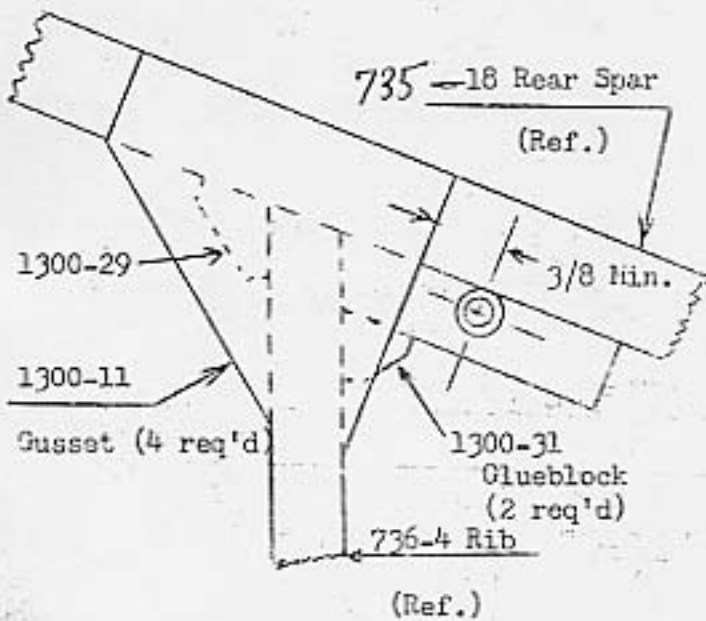
1/4 (Ref)

2-1/4

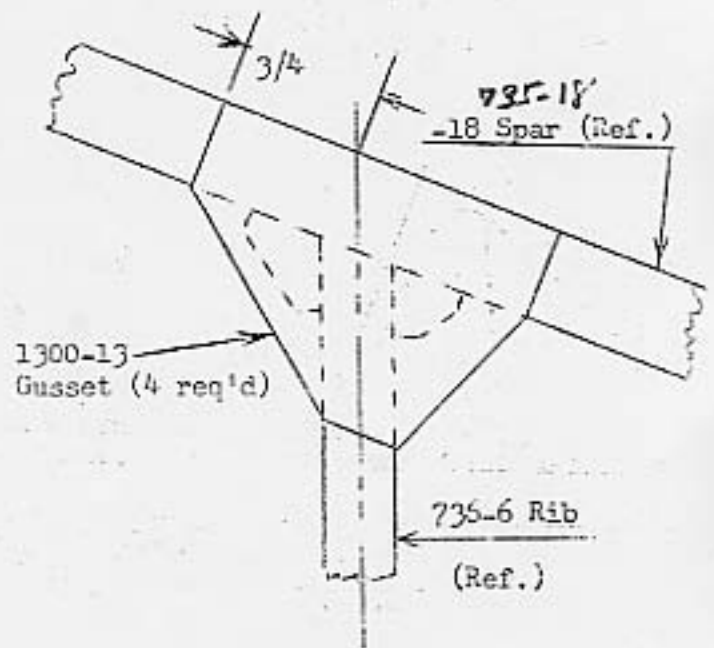
2-1/4

Figure 2

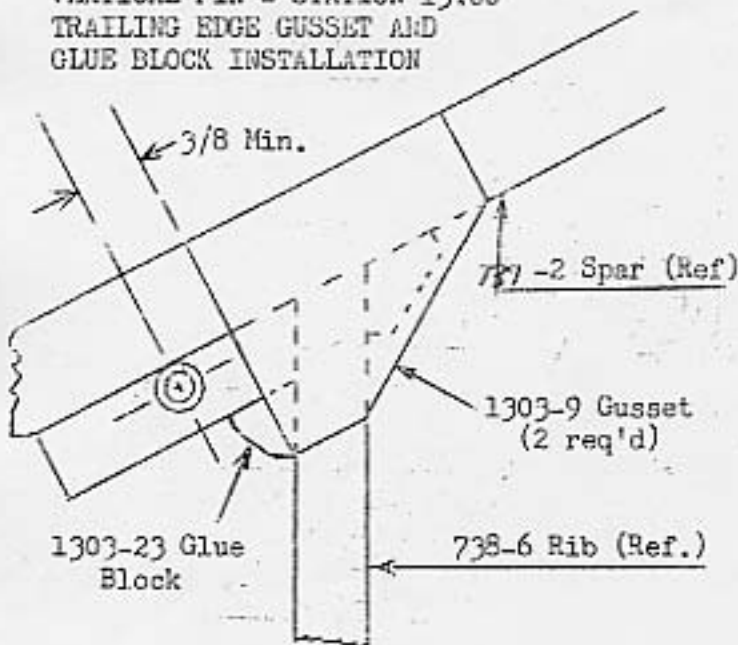
STABILIZER - STATION 16.375  
TRAILING EDGE GUSSET AND GLUE  
BLOCK INSTALLATION



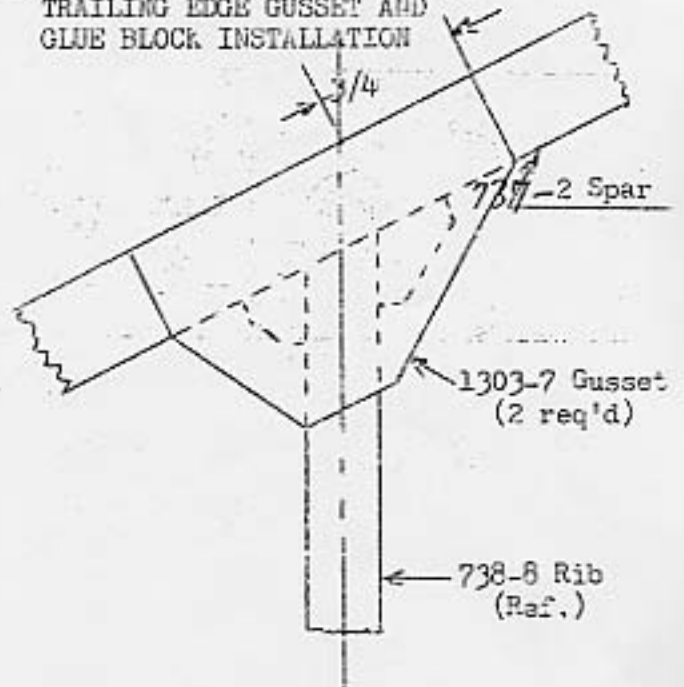
STABILIZER - STATION 32.75  
TRAILING EDGE GUSSET AND GLUE  
BLOCK INSTALLATION



VERTICAL FIN - STATION 13.00  
TRAILING EDGE GUSSET AND  
GLUE BLOCK INSTALLATION



VERTICAL FIN - STATION 25.25  
TRAILING EDGE GUSSET AND  
GLUE BLOCK INSTALLATION



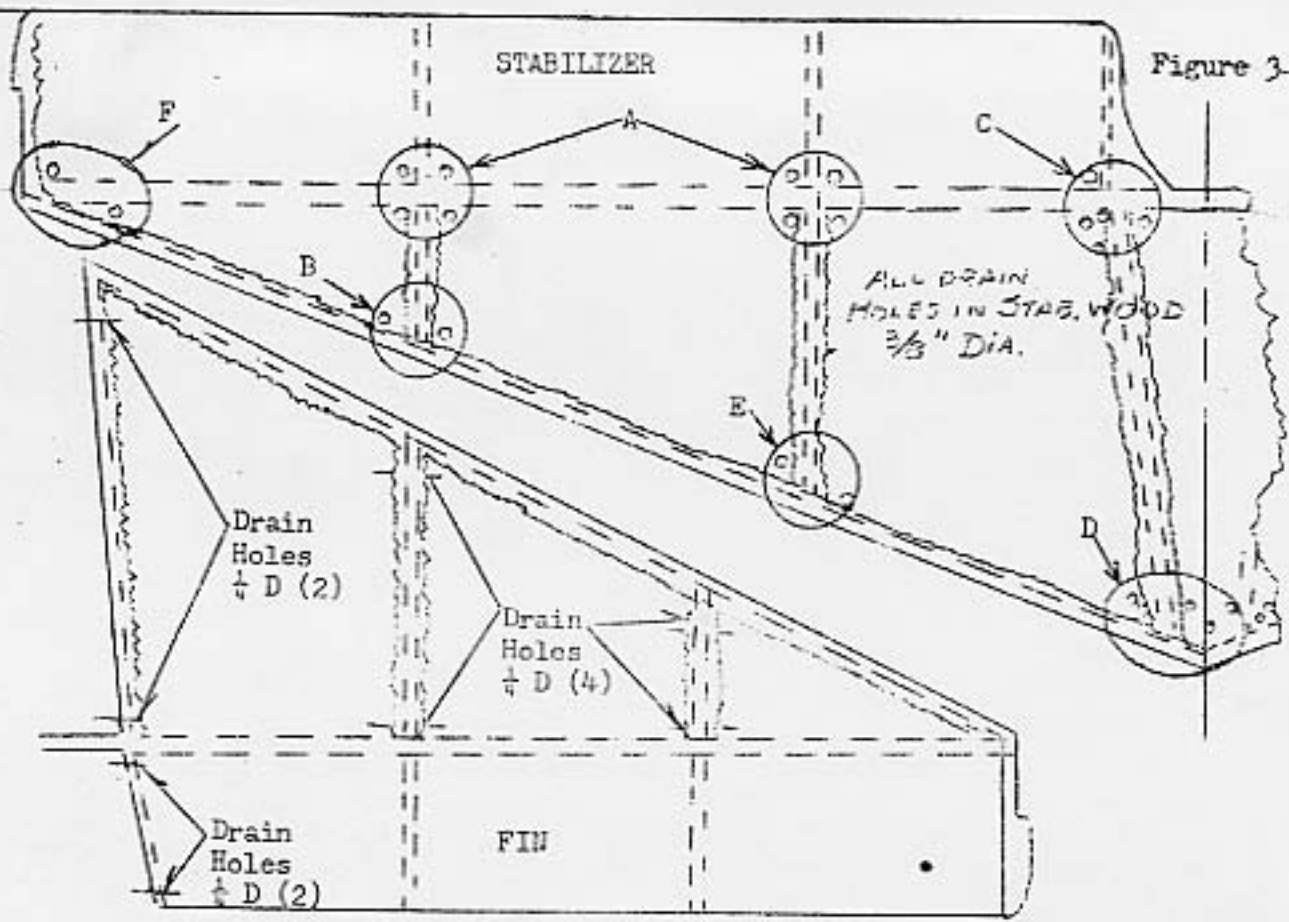


Figure 3

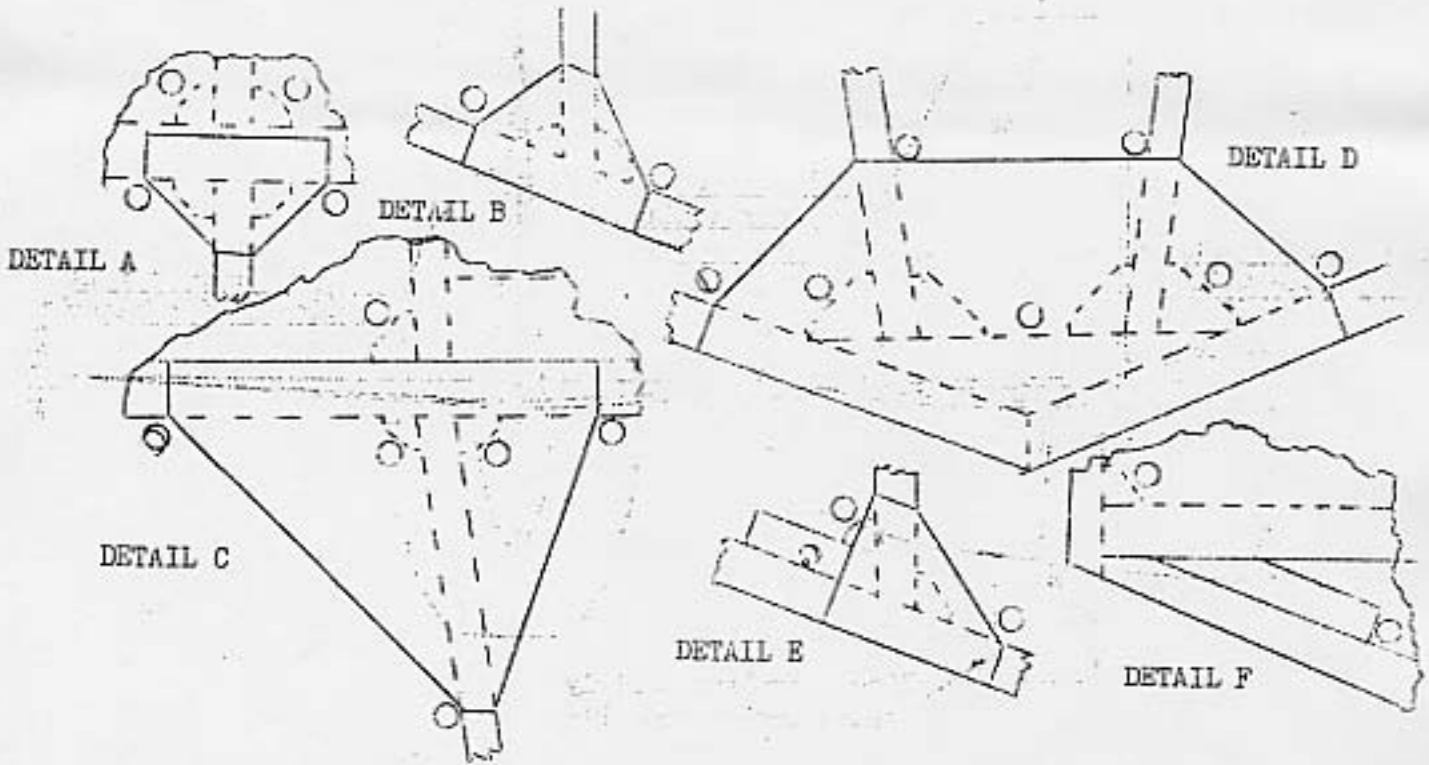
ALL DRAIN HOLES IN STAB. WOOD 3/8" DIA.

Drain Holes 1/4 D (2)

Drain Holes 1/4 D (4)

Drain Holes 1/4 D (2)

FIN



NOTE

- 1) Use AN 231-2 Grommets on Fabric over all drain holes in Stabilizer and Fin Root Rib.
- 2) Drill Fin Drains in Ribs and clear hole in Root Rib after Fabric Installation.
- 3) Exercise care in drilling Drain Holes so as not to damage adjacent structure.

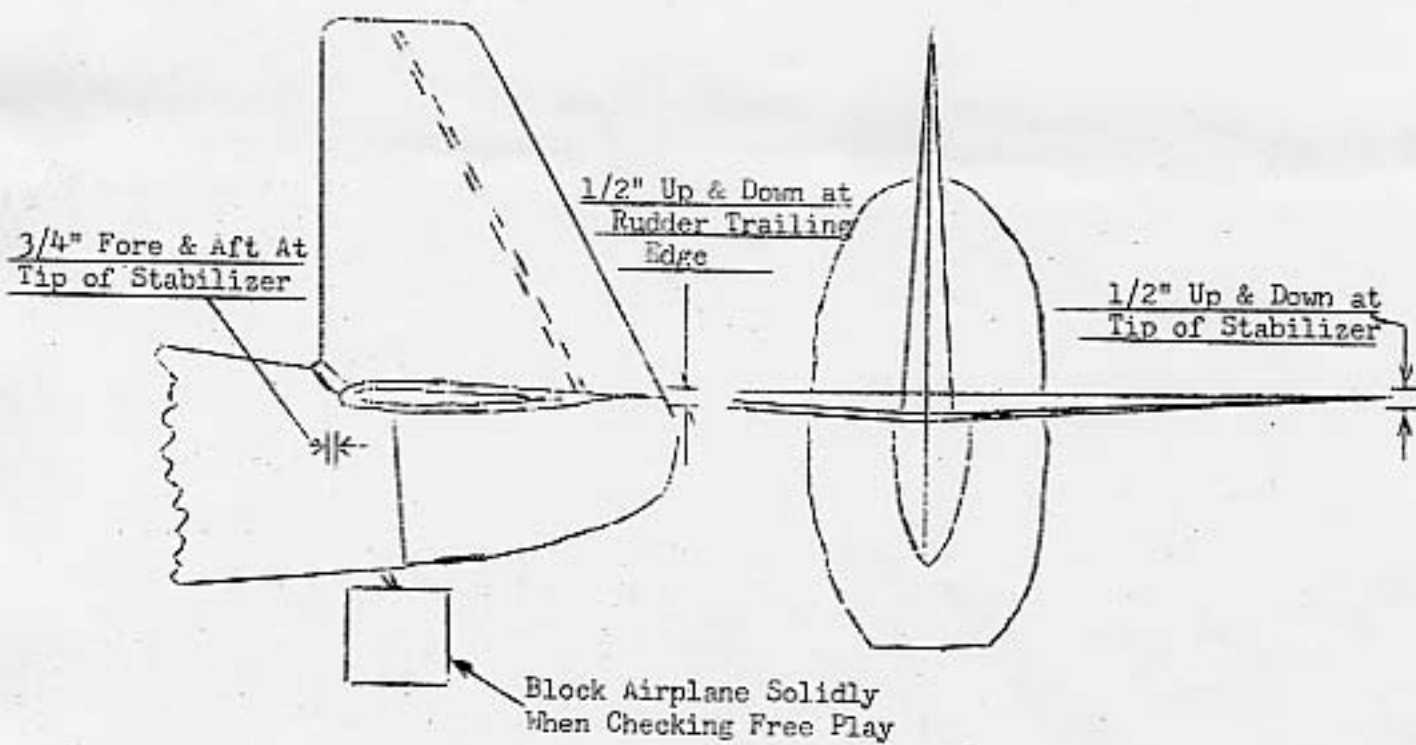
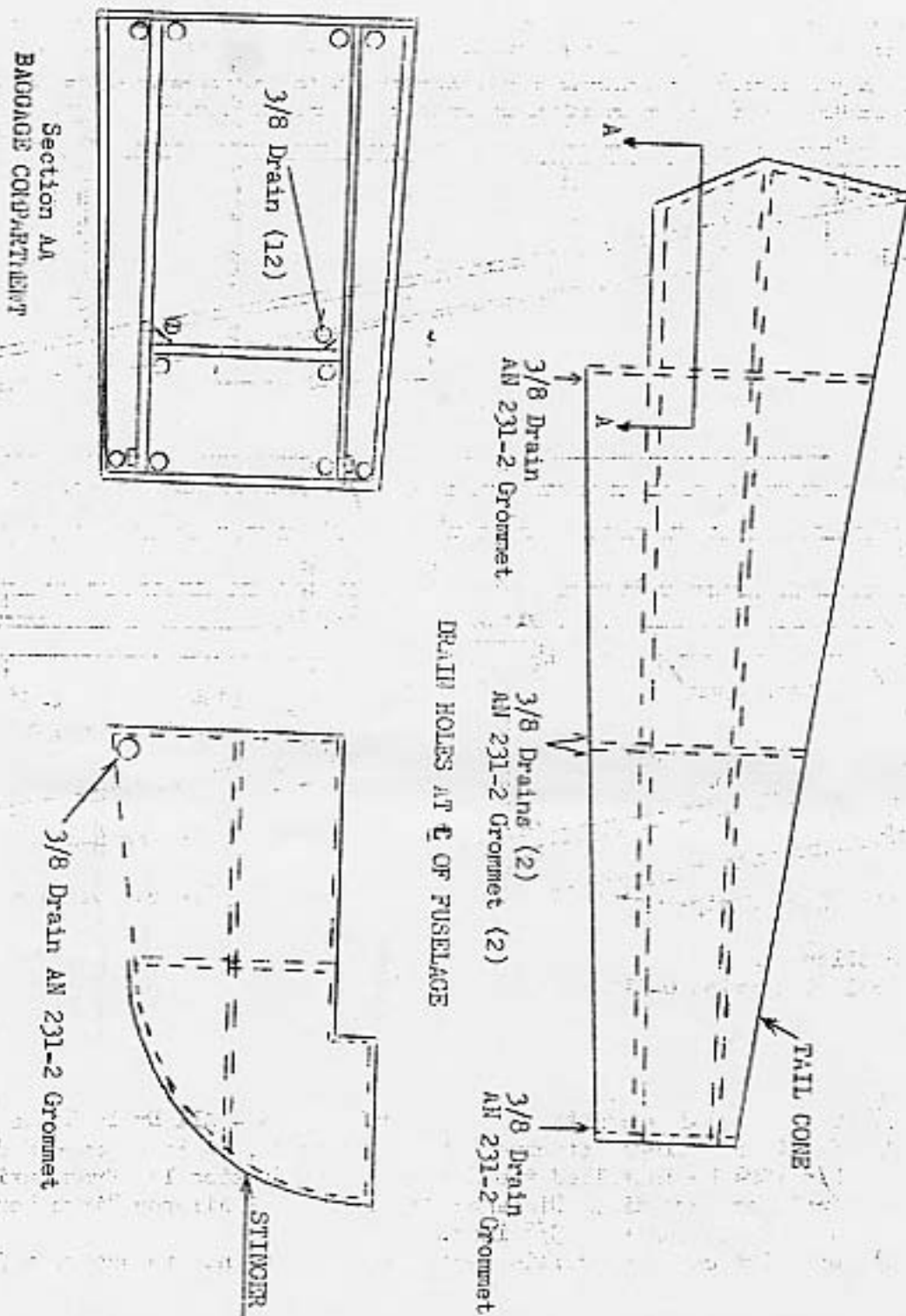
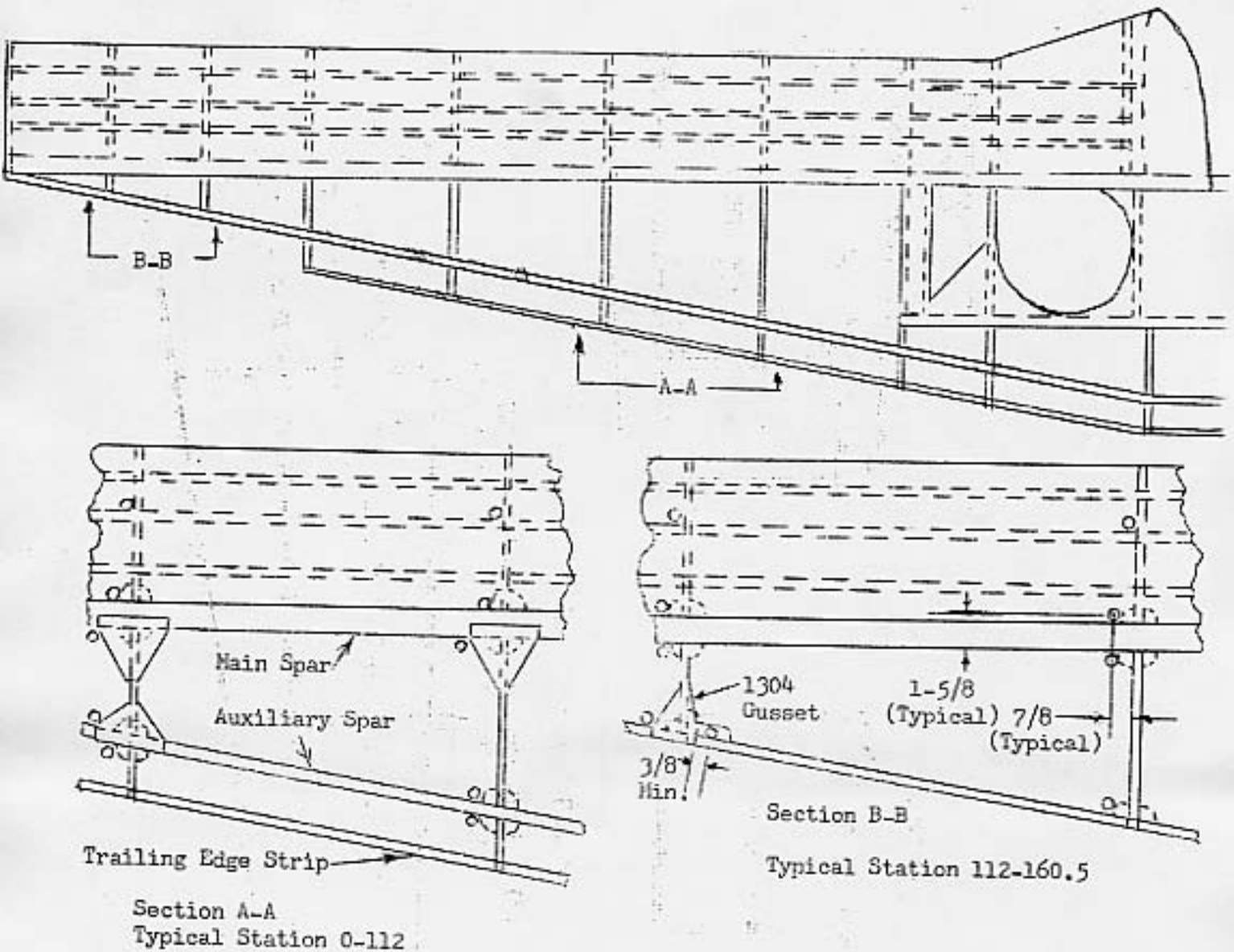


Figure 5







## NOTE

- 1) Use AN 231-1 Grommets over all Drain Holes - All Drain Holes 3/8 diameter.
- 2) If Aileron Hinge Attachment is found loose, it is recommended that Gusset P/N 1304 be installed top and bottom at Station 148 from Auxiliary Spar to Trailing Edge Rib. Distance from center of Aileron Hinge Mount Hole to Gusset no less than 3/8 inch.
- 3) Exercise care in drilling Drain Holes so as not to damage adjacent structure.



INSPECTION REPORT

Please complete and return this form to Mooney Aircraft, Inc., P. O. Box 72, Kerrville, Texas.

M-18 Service Letter 16 has been complied with on the following airplane:

Registration Number \_\_\_\_\_

Total Hours on Airplane \_\_\_\_\_

Each paragraph below refers directly by number to an item in the Inspection Instructions in 11-18 Service Letter No. 16. Each paragraph below carries a blank for hours on each group of parts inspected. This is done in case the parts in question have been replaced or undergone major rework in the area inspected. If this time is the same as that on the airplane state same. If not, state time since replacement or major rework and indicate in space following hours what work was done.

Your cooperation in completing and returning this form will be greatly appreciated.

Please state condition of parts in blanks. If more space is needed, please add note.

1. Part A-2. Hours \_\_\_\_\_.

a) bolts \_\_\_\_\_

b) bushings \_\_\_\_\_

c) fitting and lugs \_\_\_\_\_

d) wood \_\_\_\_\_

2. Part A-3. Hours \_\_\_\_\_.

a) wood \_\_\_\_\_

b) glue joints at corner blocks and gussets \_\_\_\_\_

c) glue joints attaching leading edge skin \_\_\_\_\_

3. Part A-4. Hours \_\_\_\_\_.

a) glue joint at attach block \_\_\_\_\_

b) spar at center section \_\_\_\_\_

4. Part A-7. Hours \_\_\_\_\_.

a) tail truss welds \_\_\_\_\_

b) control horn welds \_\_\_\_\_

c) control hinge welds \_\_\_\_\_

5. Part A-8. Hours \_\_\_\_\_.

a) fittings and attachments \_\_\_\_\_

b) bulkhead \_\_\_\_\_

c) trim linkage and attachment \_\_\_\_\_

6. Part A-9. Hours \_\_\_\_\_.

Record play at:

a) horizontal stabilizer, up and down \_\_\_\_\_

b) horizontal stabilizer, fore and aft \_\_\_\_\_

c) bottom of rudder, up and down \_\_\_\_\_

7. Part B-1. Hours \_\_\_\_\_.

a) wood at fittings \_\_\_\_\_

b) wood at drain holes \_\_\_\_\_

c) glue joints \_\_\_\_\_

8. Part C-1. Hours \_\_\_\_\_.

a) wood \_\_\_\_\_

b) glue joints \_\_\_\_\_

9. Part C-2. Hours \_\_\_\_\_.

a) wood \_\_\_\_\_

b) glue joints \_\_\_\_\_

c) spar at gear fittings \_\_\_\_\_

10. Part C-3. Hours \_\_\_\_\_.

a) wood \_\_\_\_\_

b) glue joints \_\_\_\_\_

11. Part C-4. Hours \_\_\_\_\_.

a) control horn weld \_\_\_\_\_

b) control hinge weld \_\_\_\_\_

12. Part C-5. Hours \_\_\_\_\_.

a) wood \_\_\_\_\_

b) glue joints \_\_\_\_\_

13. Part D-1. Hours \_\_\_\_\_.

a) welds \_\_\_\_\_

b) bolted points \_\_\_\_\_

Report Produced By:

Address:

Phone:

# Airworthiness Directive Compliance Record

File ID: **NEW**

USARL Research Date: 11/18/1999

11/18/1999

Manufacturer  
Mooney Aircraft Corp.

Model  
M-18LA

Part # :  
Serial # : 103

AD Number Effective date	Description	Complied Date Time	Status Method of Compliance/Applicability	Once or Recur	Next Due Date Time	1. Facility 2. Cert. Type 3. Cert. Num. 4. Author, by
51-03-01 01/01/1951	To preclude the possibility of failure of the fuel line due to vibration and			Once		1. 2. 3. 4.
<b>eATP</b>				<b>eATP</b>	Signature:	
53-17-01 01/01/1953	To prevent possible fouling of controls and the control stick by foreign			Once		1. 2. 3. 4.
<b>eATP</b>				<b>eATP</b>	Signature:	
59-22-03 01/01/1959	Inspection, repairs, and replacements of the empennage			Once		1. 2. 3. 4.
<b>eATP</b>				<b>eATP</b>	Signature:	
79-11-05 R1 04/01/1981	To prevent failure of the vertical fin spar in flight due to wood			Recur		1. 2. 3. 4.
<b>eATP</b>				<b>eATP</b>	Signature:	
79-18-07 09/03/1979	To prevent failure of structural areas due to wood deterioration and to detect			Recur		1. 2. 3. 4.
<b>eATP</b>	<i>including fuel.</i>			<b>eATP</b>	Signature:	
<b>eATP</b>				<b>eATP</b>	Signature:	1. 2. 3. 4.