



WIPLINE FLOATS • SKIS • MODIFICATIONS • AIRCRAFT SALES  
AVIONICS • INTERIOR • MAINTENANCE • PAINT REFINISHING

---

**STRUCTURAL REPAIR MANUAL**  
**FOR**  
**WIPLINE ALUMINUM FLOATS**

1700 Henry Ave – Fleming Field (KSGS), South St. Paul, MN 55075

Ph: 651.451.1205 Fax: 651.457.7858

[www.wipaire.com](http://www.wipaire.com)

THIS PAGE INTENTIONALLY LEFT BLANK



## TABLE OF CONTENTS

LOG OF REVISION.....	5
LIST OF EFFECTIVE PAGES .....	6
INTRODUCTION .....	8
1.0 HARD LANDING AND DAMAGE INVESTIGATION.....	9
2.0 CORROSION REMOVAL.....	10
TABLE 2-1: CORROSION LIMITS .....	10
3.0 RIVET REPLACEMENT .....	11
4.0 FLOAT HULL SHEET METAL .....	12
4.1 FLOAT SKIN DAMAGE REPAIR (ALL MODELS) .....	13
4.2 WIPLINE MODEL 10000 & 13000 OPTIONAL ACCESS HOLE REPAIR .....	16
4.3 WIPLINE SKIN AND BULKHEAD THICKNESSES .....	17
4.4 WIPLINE MODELS 3730/3900/4000/6000/6100 AND 8000 SKIN TO KEEL REPAIR.....	20
5.0 FLOAT HULL EXTRUSIONS .....	23
5.1 2100/2350 Float Extrusion Repairs.....	23
5.1.1 Simple Extrusion Splice Repair .....	23
5.2 3000/3450 Float Extrusion Repairs .....	27
5.2.1 Simple Extrusion Splice Repair .....	27
5.2.2 Main Keel Extrusion Splice Repair .....	30
5.3 3730/3900 Float Extrusion Repairs.....	32
5.3.1 Simple Extrusion Splice Repair .....	32
5.3.2 Complex Extrusion Splice Repair .....	34
5.4 4000 Float Extrusion Repairs.....	36
5.4.2 Complex Extrusion Splice Repair .....	38
5.5 6000 Float Extrusion Repairs.....	40
5.5.1 Simple Extrusion Splice Repair .....	40
5.5.2 Complex Extrusion Splice Repair .....	42
5.6 7000 Float Extrusion Repairs.....	44
5.6.1 Simple Extrusion Splice Repair .....	44

STRUCTURAL REPAIR MANUAL FOR WIPLINE ALUMINUM FLOATS

5.6.2 Main Keel Extrusion Splice Repair..... 47

5.7 8000 Float Extrusion Repairs..... 49

    5.7.1 Simple Extrusion Splice Repair ..... 49

    5.7.2 Complex Extrusion Splice Repair ..... 51

5.8 8750 Float Extrusion Repairs..... 53

    5.8.1 Simple Extrusion Splice Repair ..... 53

    5.8.2 Main Keel Extrusion Splice Repair..... 56

5.9 10000 Float Extrusion Repairs..... 58

    5.9.1 Simple Extrusion Splice Repair ..... 58

    5.9.2 Main Keel Extrusion Splice Repair..... 61

    5.9.3 Main and Front Strut Fitting Repair..... 63

5.10 13000 Float Extrusion Repairs ..... 66

    5.10.1 Simple Extrusion Splice Repair ..... 66

    5.10.2 Main Keel Extrusion Splice Repair ..... 70

6.0 FLOAT HULL BULKHEADS ..... 72

    6.1 Complete Bulkhead Replacement..... 73

    6.2 Partial Bulkhead Replacement ..... 73

    6.3 Bulkhead Reinforcement..... 73

    6.4 Bulkhead Repair ..... 73

    6.5 Bulkhead Buckling and Cracking ..... 73

        6.5.1 Bulkhead Buckling..... 73

        6.5.2 Bulkhead Cracking..... 73

**LOG OF REVISION**

REV NO.	PAGES	DESCRIPTION	DATE
IR	ALL	INITIAL RELEASE	9/18/14
A	67	ADDED BULKHEAD REPAIR	11/10/15
B	20 - 22, 63 - 65, 73	ADDED KEEL REPAIR DATA, 10000 STRUT FITTING BUSHING REPAIR AND BULKHEAD BUCKLING AND CRACKING INFORMATION	01/15/16

**LIST OF EFFECTIVE PAGES**

<u>Page</u>	<u>Revision Level</u>	<u>Page</u>	<u>Revision Level</u>	<u>Page</u>	<u>Revision Level</u>
1	IR	26	IR	51	IR
2	IR	27	IR	52	IR
3	B	28	IR	53	IR
4	B	29	IR	54	IR
5	B	30	IR	55	IR
6	B	31	IR	56	IR
7	IR	32	IR	57	IR
8	IR	33	IR	58	IR
9	IR	34	IR	59	IR
10	IR	35	IR	60	IR
11	IR	36	IR	61	IR
12	IR	37	IR	62	IR
13	IR	38	IR	63	B
14	IR	39	IR	64	B
15	IR	40	IR	65	B
16	IR	41	IR	66	IR
17	IR	42	IR	67	IR
18	IR	43	IR	68	IR
19	IR	44	IR	69	IR
20	B	45	IR	70	IR
21	B	46	IR	71	IR
22	B	47	IR	72	IR
23	IR	48	IR	73	B
24	IR	49	IR		
25	IR	50	IR		

THIS PAGE INTENTIONALLY LEFT BLANK

## INTRODUCTION

This manual describes standard repairs for Wipline aluminum floats. Contact Wipaire for repairs not covered by this manual.

This manual is revised periodically and needs to be kept updated. Updates are available at [www.wipaire.com](http://www.wipaire.com) at no charge.

The service products referred to throughout this manual are described by their trade name and may be purchased from the factory Parts Department.

To contact Wipaire for repair assistance or parts sales, call or write:

Wipaire Customer Service  
Telephone: 651.451.1205 or 1.888.947.2473  
Fax: 651.306.0666  
Email: [customerservice@wipaire.com](mailto:customerservice@wipaire.com)



## **1.0 HARD LANDING AND DAMAGE INVESTIGATION**

After a thorough cleaning of the suspected damaged area, all parts should be carefully examined to determine the extent of the damage. Frequently, the force causing the initial damage is transmitted from one member to the next, causing strains and distortions. Abnormal stresses incurred by shock or impact forces on a rib, bulkhead, or similar structure may be transmitted to the extremity of the structural member. These stresses may result in secondary damage, such as sheared or stretched rivets, elongated bolt holes, or damaged skins or bulkheads. Points of attachment should be examined carefully for distortion, and the security of fasteners in the primary and secondary damaged areas at locations beyond the local damage. Inspect aircraft tubes in the areas of float fitting attachment for signs of bending, cracked welds, or other signs of damage.

## 2.0 CORROSION REMOVAL

To prevent and detect corrosion follow the procedures outlined in the appropriate float service manual.

Corrosion appears as a white or pale green powder, discoloration of a metal surface, or bubbles and blisters under the surface of the paint.

If the corrosion does not exceed the corrosion limits listed in Table 1-1, the corrosion can be removed. Thoroughly clean the affected area. Remove light corrosion (discoloration, minimal pitting) with gentle sanding or washing with a chromic acid solution. Remove moderate and severe corrosion (blistering, flaking, pitting) with heavier sanding and grinding.

After removing the corrosion, restore the area to the original finish. Typically this is either priming and enameling, or coating bare metal with waterproof grease. Apply CorrosionX or an equivalent to the affected area to stop corrosion and repel moisture and contaminants.

If the corrosion exceeds the corrosion limits listed in Table 2-1, refer to section 4.0 of this manual for typical reinforcement or replacement of the affected areas. Contact Wipaire Customer Service with questions.

AREA	ALLOWABLE THICKNESS LOSS
Bottom Skins	30%
Side Skins (forward of step)	30%
Side Skins (aft of step)	20%
Top Skins	30%
Machinings	0.015"
Extrusions	0.015"
Struts	0.030"
<p>NOTES:</p> <ol style="list-style-type: none"> <li>1. Maximum surface area for skin corrosion, up to the maximum depth, shall not exceed one square inch and must be separated by at least 14 inches from any other skin corrosion damage.</li> <li>2. For machined fittings, struts and pylons, corrosion limits are provided as maximum pitting depths. Corroded surface area of shall not exceed 0.5 square inches and must be separated by at least 5 inches from any other corrosion damage.</li> </ol>	

**TABLE 2-1: CORROSION LIMITS**

### **3.0 RIVET REPLACEMENT**

There are instances during float repair where replacement of solid rivets is not practical. For these occasions, Wipaire has composed a list of acceptable fastener substitutions.

Solid rivets may be replaced by the following fasteners with equal or greater diameter than the original rivet:

1. New solid rivet
2. CherryMAX blind rivet
3. HuckLok blind rivet
4. Hi-Lok fastener

**NOTES:**

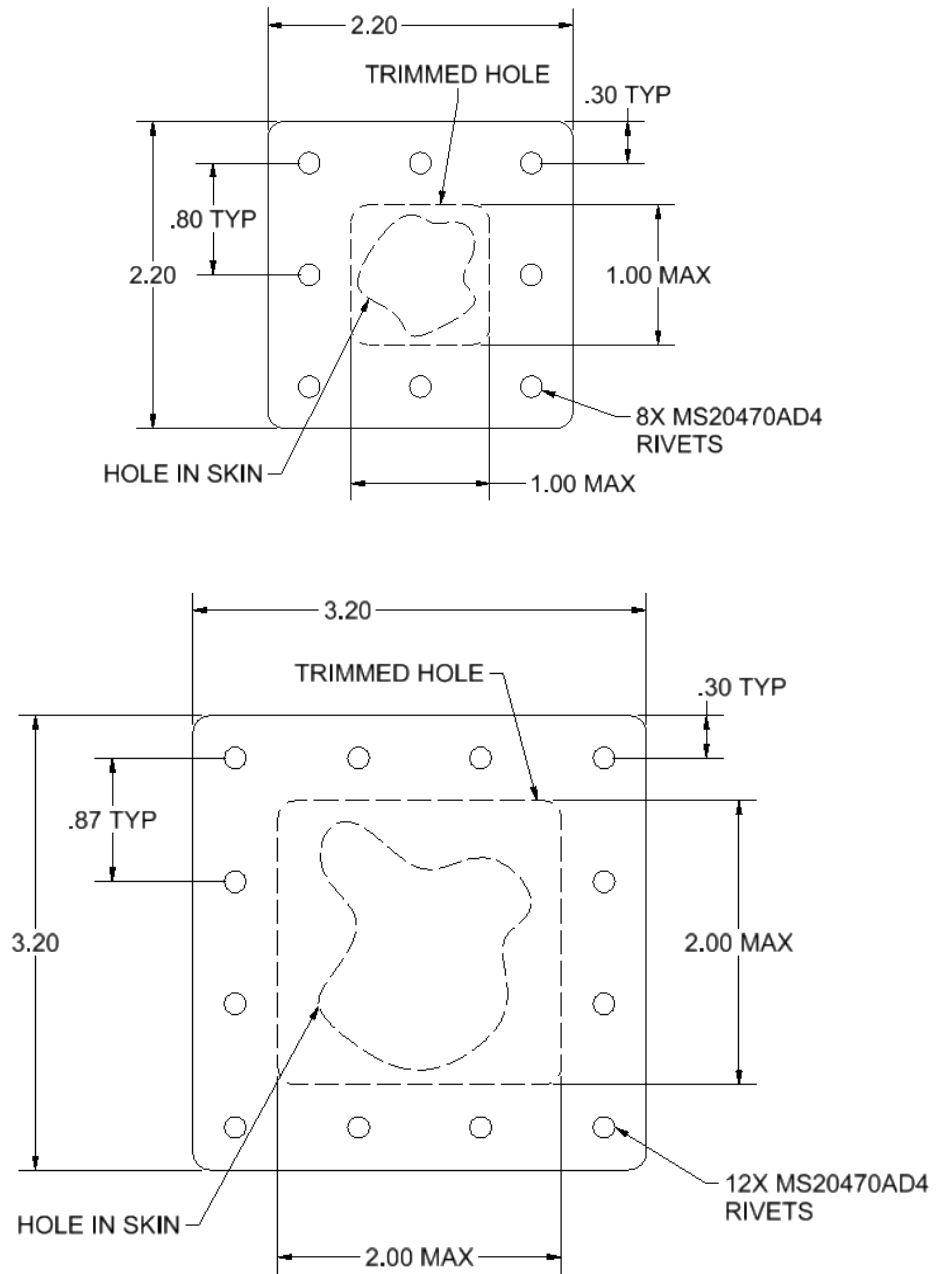
1. When installing any structural fasteners, edge distance and rivet spacing guidelines per AC 43.13-1B should be followed at all times.
2. In areas where solid rivets are smoking or missing, blind rivets are an acceptable short term solution but should be replaced with solid rivets or Hi-Lok fasteners.
3. Follow fastener manufacturer guidelines for installation.

#### **4.0 FLOAT HULL SHEET METAL**

Damage to any sheet metal, including but not limited to skins and bulkheads, may be repaired per the figures in this section, or any acceptable repair method listed in FAA Advisory Circular 43.13-1B.

Float hull sheet metal or part thereof can be purchased from Wipaire. To simplify repairs, the sheet metal can be ordered precut and predrilled. Contact Wipaire Customer Service to order parts.

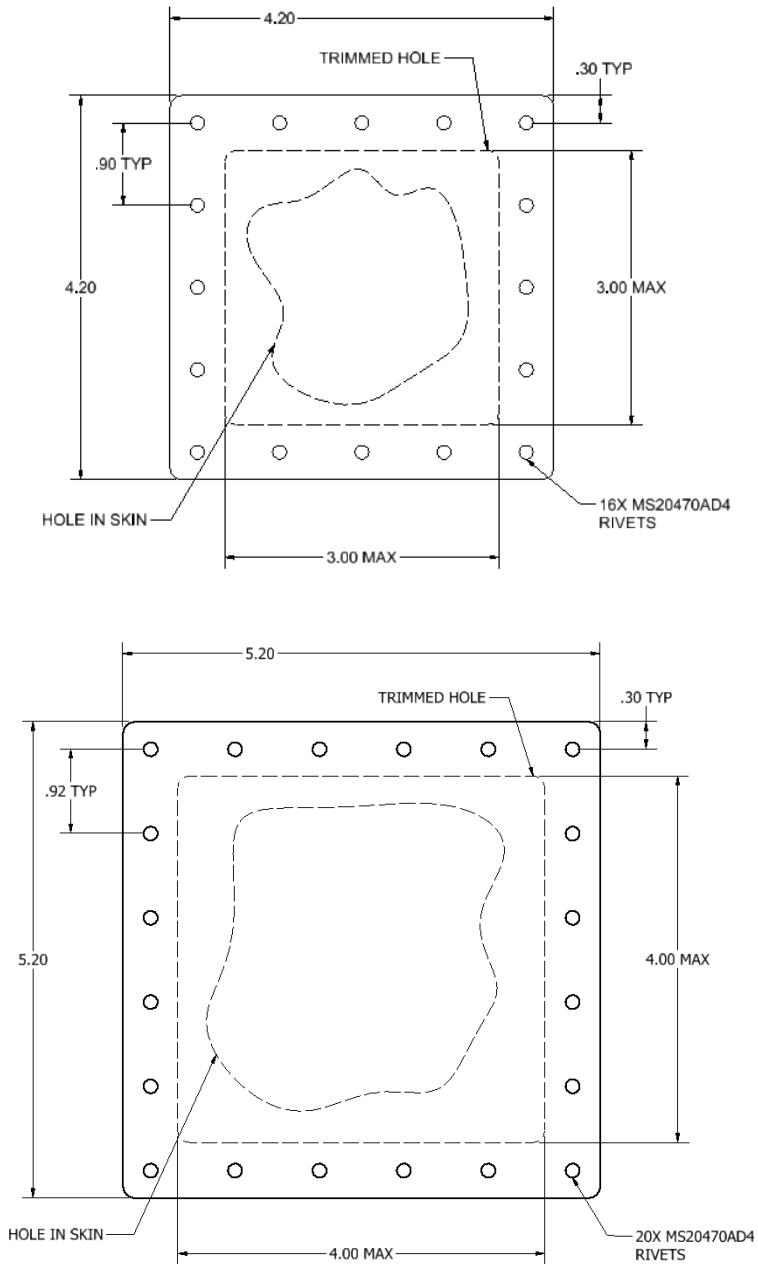
**4.1 FLOAT SKIN DAMAGE REPAIR (ALL MODELS)**



1. Trim hole as shown by dotted line
2. Patch to be same material with equal or greater thickness than original skin  
(See Table 4-1)
3. Prime all bare surfaces
4. Seal between patch and skin
5. Rivet in place

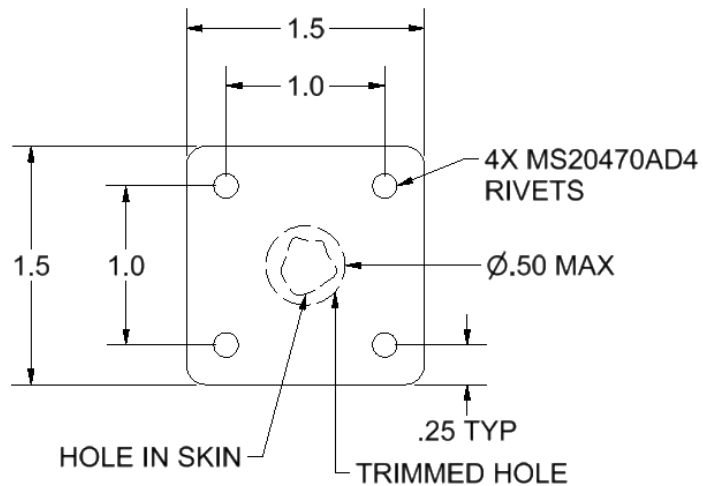
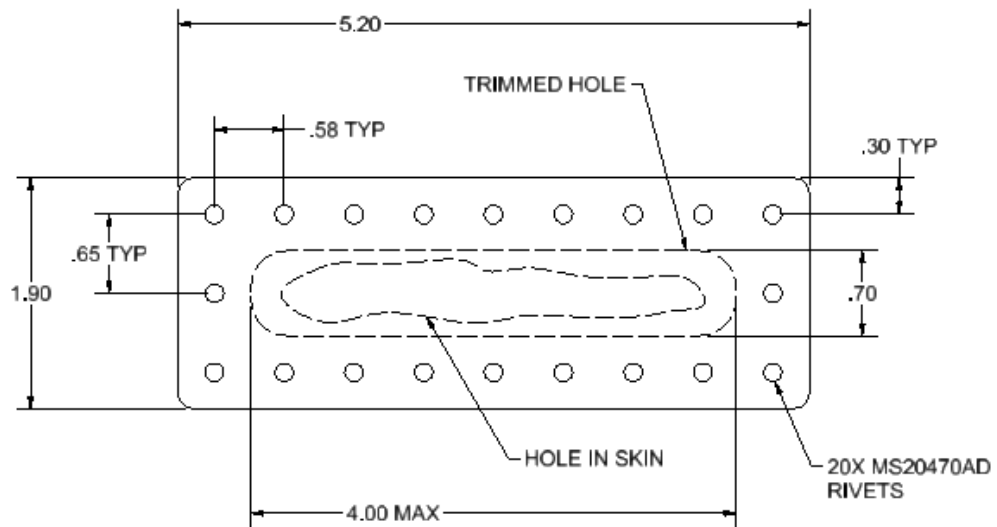
**FIGURE 4-1A: SHEET METAL REPAIR**

## STRUCTURAL REPAIR MANUAL FOR WIPLINE ALUMINUM FLOATS



1. Trim hole as shown by dotted line
2. Patch to be same material with equal or greater thickness than original skin (See Table 4-1)
3. Prime all bare surfaces
4. Seal between patch and skin
5. Rivet in place

**FIGURE 4-1B: SHEET METAL REPAIR**

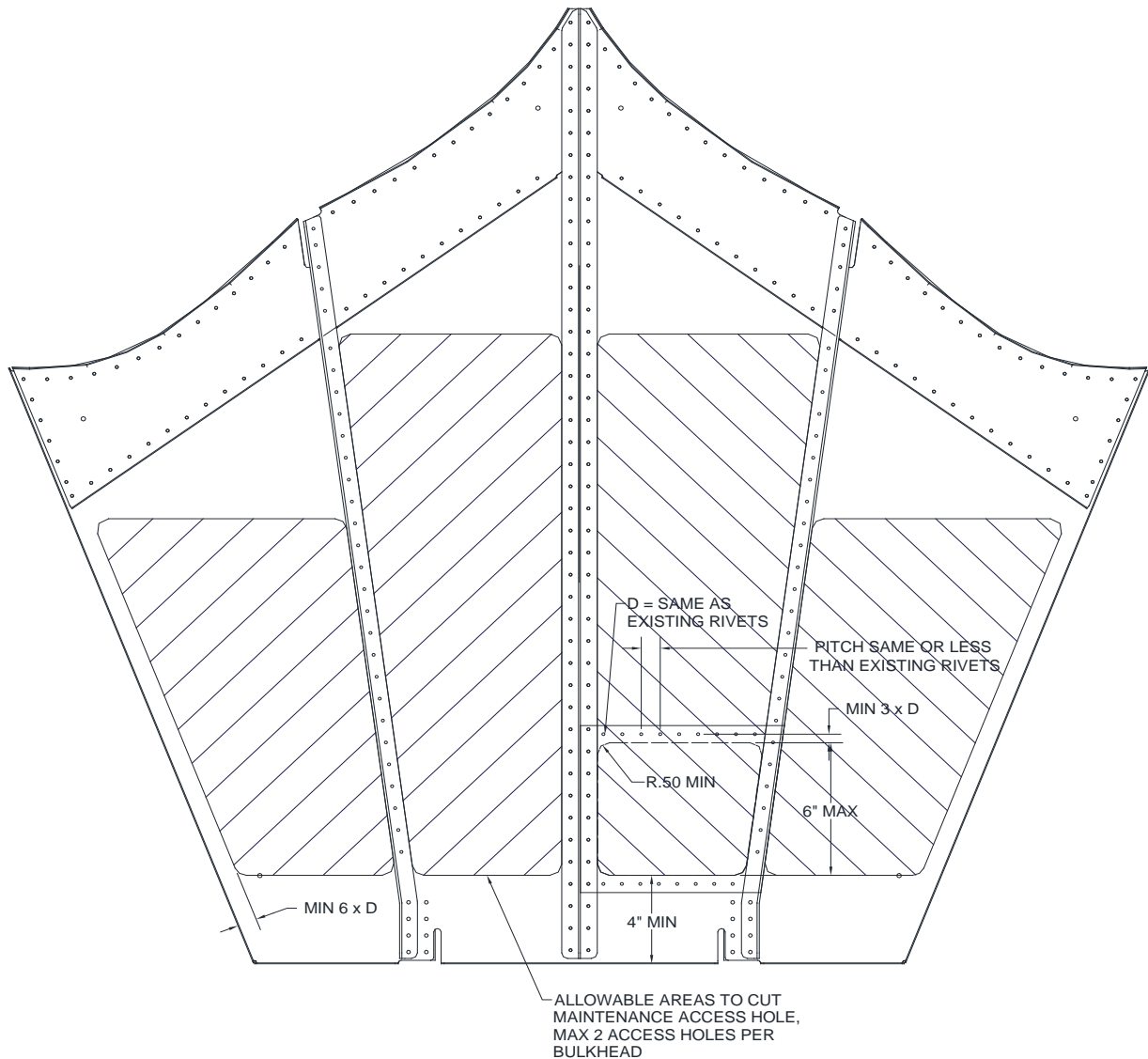


1. Trim hole as shown by dotted line
2. Patch to be same material with equal or greater thickness than original skin  
(See Table 4.1)
3. Prime all bare surfaces
4. Seal between patch and skin
5. Rivet in place

**FIGURE 4-1C: SHEET METAL REPAIR**

## 4.2 WIPLINE MODEL 10000 & 13000 OPTIONAL ACCESS HOLE REPAIR

During extensive float maintenance of 10000 and 13000 floats, it may be desirable to cut an access hole in a solid bulkhead to enable replacement of neighboring float structure. This type of access hole can be cut and then repaired according to Figure 4-2. **Note that this is only acceptable practice on the 10000 and 13000 floats.**



- NOTE(S):
1. ACCESS HOLES MAY BE CUT FOR THE PURPOSE OF MAINTENANCE
  2. MAX 2 ACCESS HOLES PER BULKHEAD
  3. RIVET PATCH OVER ACCESS HOLE ONCE MAINTENANCE IS COMPLETE
  4. PATCH MUST BE OF THE SAME, OR STRONGER ALLOY (6061-T6 OR 2024-T3), WITH THE SAME THICKNESS AS THE ORIGINAL PANEL, OR ONE GAGE THICKNESS GREATER
  4. USE SOLID RIVETS OF SAME DIAMETER AS EXISTING RIVETS, OR 1 SIZE LARGER; ALTERNATELY USE CHERRY MAX (OR EQUIVALENT) FASTENER OF SAME DIAMETER, OR 1 SIZE LARGER

KEY:  
D = DIAMETER  
R = RADIUS

**FIGURE 4-2: BULKHEAD ACCESS HOLE REPAIR**



**4.3 WIPLINE SKIN AND BULKHEAD THICKNESSES**

		FLOAT		
		2100/2300	3000/3450	3730/3900
<b>Skins</b>	<b>Top</b>	6061-T6 / .025"	6061-T6 / .025"	2024-T3 / .032"
	<b>Side</b>	6061-T6 / .025"	6061-T6 / .025"	2024-T3 / .032"
	<b>Bottom</b>	2024-T3 / .032"	6061-T6 / .040"	6061-T6 / .040"
	<b>Afterbody</b>	2024-T3 / .025"	6061-T6 / .025"	2024-T3 / .032"
<b>Bulkheads</b>	<b>Nose</b>	6061-T6 / .063"	6061-T6 / .080"	6061-T6 / .100"
	<b>Forward (except nose)</b>	6061-T6 / .032"	6061-T6 / .032"	2024-T3 / .032"
	<b>Aft Wheel Well</b>	6061-T6 / .032"	6061-T6 / .032"	2024-T3 / .050"
	<b>Aft (except aft wheel well)</b>	6061-T6 / .032"	6061-T6 / .032"	2024-T3 / .040"

Note: See appropriate parts manual at [www.wipaire.com](http://www.wipaire.com) to identify damaged part(s)

		FLOAT		
		4000	6000/6100	8000
<b>Skins</b>	<b>Top</b>	6061-T6 / .032"	6061-T6 / .032"	6061-T6 / .032"
	<b>Side</b>	2024-T3 / .025"	6061-T6 / .032"	6061-T6 / .032"
	<b>Bottom</b>	6061-T6 / .040"	6061-T6 / .040"	6061-T6 / .040"
	<b>Afterbody</b>	2024-T3 / .025"	6061-T6 / .032"	6061-T6 / .032"
<b>Bulkheads</b>	<b>Nose</b>	6061-T6 / .100"	6061-T6 / .100"	6061-T6 / .100"
	<b>Forward (except nose)</b>	6061-T6 / .032"	6061-T6 / .032"	6061-T6 / .032"
	<b>Aft Wheel Well</b>	6061-T6 / .050"	6061-T6 / .050"	6061-T6 / .050"
	<b>Aft (except aft wheel well)</b>	6061-T6 / .032"	6061-T6 / .040"	6061-T6 / .040"

Note: See appropriate parts manual at [www.wipaire.com](http://www.wipaire.com) to identify damaged part(s)

**TABLE 4-1: SHEET METAL ALUMINUM MATERIAL/THICKNESS**

(Continues on the next page)

STRUCTURAL REPAIR MANUAL FOR WIPLINE ALUMINUM FLOATS

		<b>7000</b>
<b>Top Skins</b>	<b>All</b>	6061-T6 / .050"
<b>Side Skins</b>	<b>All</b>	6061-T6 / .032"
<b>Bottom Skins</b>	<b>Bulkhead 1-10 (main keel to sister keel)</b>	6061-T6 / .063"
	<b>Bulkhead 1-10 (sister keel to chine)</b>	6061-T6 / .050"
	<b>Bulkhead 10 -16</b>	6061-T6 / .032"
<b>Bulkheads</b>	<b>Bulkhead 1</b>	6061-T6 / .100"
	<b>Bulkheads 2-3</b>	6061-T6 / .040"
	<b>Bulkheads 4-10</b>	6061-T6 / .025"
	<b>Bulkhead 11 (aft wheel well)</b>	6061-T6 / .040"
	<b>Bulkheads 12-16</b>	6061-T6 / .032"

Note: See appropriate parts manual at [www.wipaire.com](http://www.wipaire.com) to identify damaged part(s)

		<b>8750</b>
<b>Top Skins</b>	<b>All</b>	6061-T6 / .050"
<b>Side Skins</b>	<b>Forwardmost (inboard and outboard)</b>	6061-T6 / .032"
	<b>Wheel Well (outboard only)</b>	2024-T3 / .050"
	<b>All Remaining</b>	2024-T3 / .032"
<b>Bottom Skins</b>	<b>Bulkhead 1-10 (main keel to sister keel)</b>	6061-T6 / .063"
	<b>Bulkhead 1-10 (sister keel to chine)</b>	6061-T6 / .050"
	<b>Bulkhead 10 -19</b>	6061-T6 / .032"
<b>Bulkheads</b>	<b>Bulkhead 1</b>	6061-T6 / .100"
	<b>Bulkheads 2-3</b>	6061-T6 / .040"
	<b>Bulkheads 4-10</b>	6061-T6 / .025"
	<b>Bulkhead 11 (aft wheel well)</b>	6061-T6 / .040"
	<b>Bulkheads 12-19</b>	6061-T6 / .032"

Note: See appropriate parts manual at [www.wipaire.com](http://www.wipaire.com) to identify damaged part(s)

**TABLE 4-1: SHEET METAL ALUMINUM MATERIAL/THICKNESS**

(Continues on the next page)

		10000/13000
<b>Top Skins</b>	<b>Forward and Aft</b>	6061-T6 / .040"
	<b>Center</b>	6061-T6 / .063"
<b>Side Skins</b>	<b>Forward and Aft</b>	6061-T6 / .040"
	<b>Center</b>	6061-T6 / .063"
<b>Bottom Skins</b>	<b>Bow to Wheel Well (main keel to sister keel)</b>	6061-T6 / .063"
	<b>Afterbody</b>	6061-T6 / .032"
	<b>All Remaining</b>	6061-T6 / .050"
<b>Bulkheads</b>	<b>Nose</b>	6061-T6 / .100"
	<b>Aft Wheel Well</b>	6061-T6 / .063"
	<b>All Remaining</b>	6061-T6 / .040"

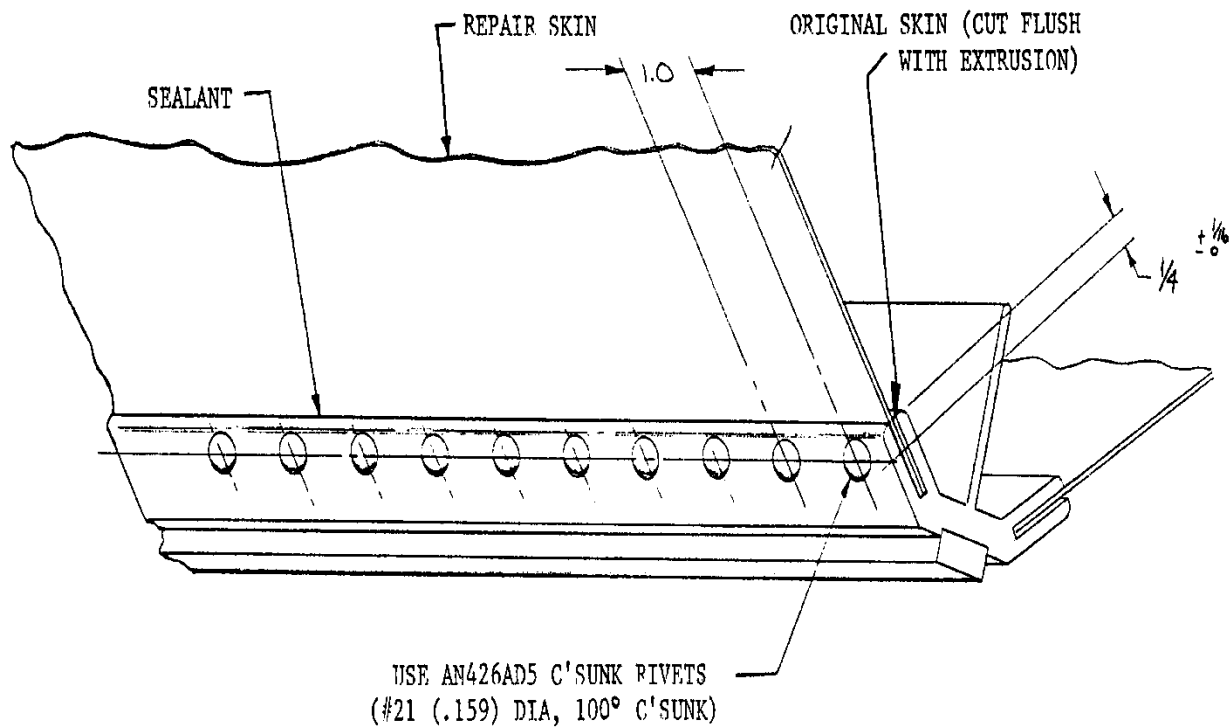
Note: See appropriate parts manual at [www.wipaire.com](http://www.wipaire.com) to identify damaged part(s)

**TABLE 4-1: SHEET METAL ALUMINUM MATERIAL/THICKNESS**

#### 4.4 WIPLINE MODELS 3730/3900/4000/6000/6100 AND 8000 SKIN TO KEEL REPAIR

All outside hull skins are bonded to the extrusions with a special heat pressure 3M adhesive. This bond adheres skins to the inside of all extrusions.

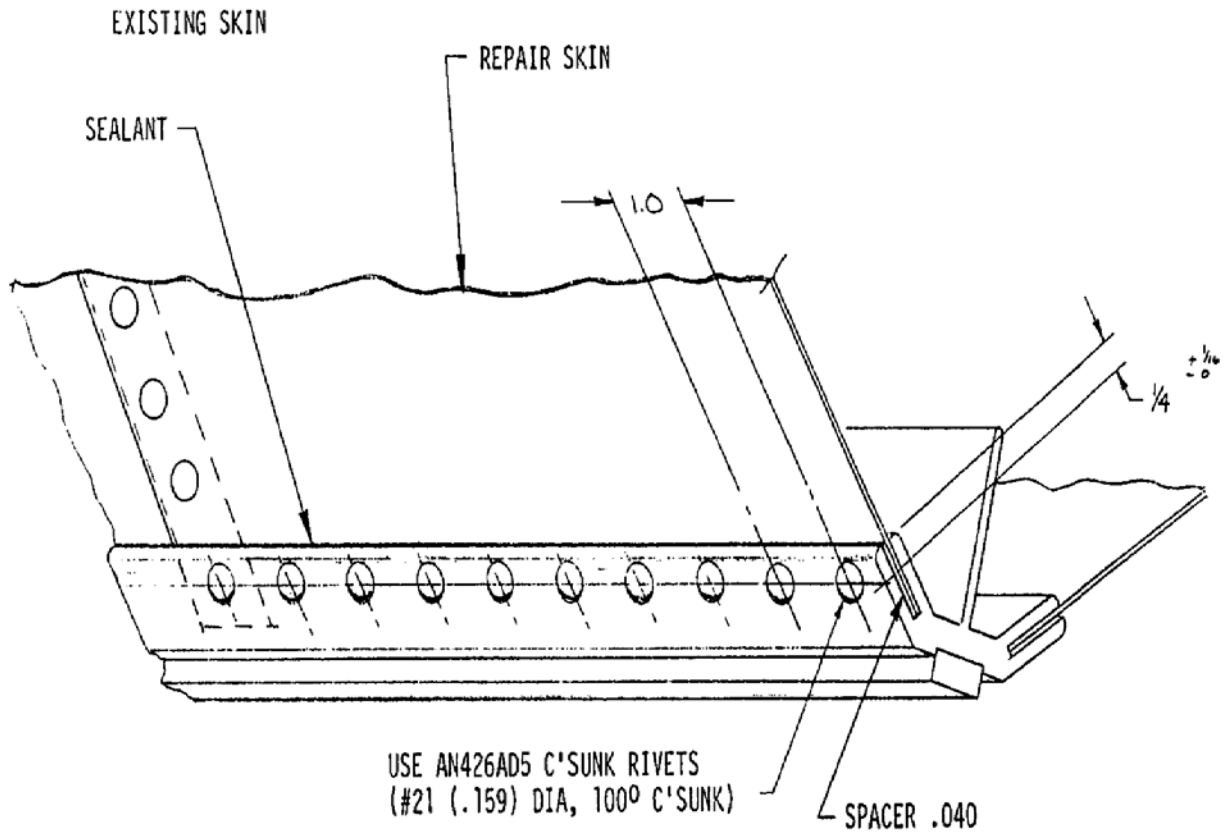
Skins may be reattached to extrusions by methods shown in Figures 4-4A, 4-4B, 4-4C. If the skin bond must be broken from an extrusion for a long distance the caulking material must first be removed from the exterior crack. Then heat the extrusion with a propane torch until the bond starts to loosen. **Caution** must be taken not to heat and loosen bonds not needing replacement.



**FIGURE 4.4A: MODEL 3730/3900/4000/6000/6100 AND 8000 TYPICAL REPAIR BOTTOM SKIN TO KEEL INSTRUCTIONS**

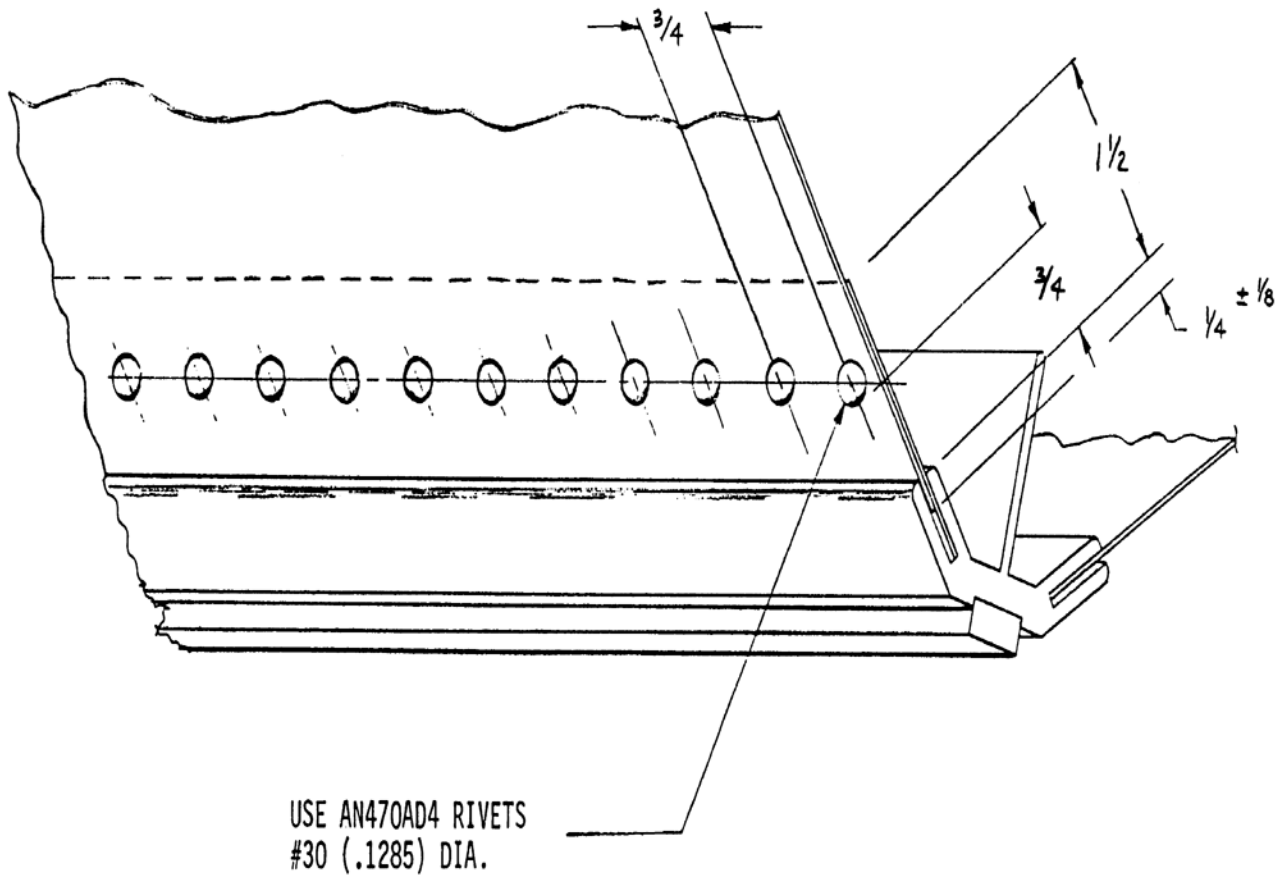
**(PREFERRED METHOD)**

1. REMOVE ORIGINAL DAMAGED SKIN CUT FLUSH WITH EXTRUSION.
2. REMOVE CAULKING FROM GROOVE OF EXTRUSION.
3. APPLY SEALANT IN GROOVE. (BE SURE TO USE PLENTY OF SEALANT!)
4. INSERT REPAIR SKIN INTO EXTRUSION.
5. DRILL AND COUNTERSINK HOLES AND RIVET INTO PLACE.



**FIGURE 4.4B: MODEL 3730/3900/4000/6000/6100 AND 8000 TYPICAL REPAIR BOTTOM SKIN TO KEEL INSTRUCTIONS**

1. REMOVE ORIGINAL DAMAGED SKIN FROM EXTRUSION.
2. REMOVE CAULKING FROM GROOVE OF EXTRUSION.
3. APPLY SEALANT IN GROOVE. (BE SURE TO USE PLENTY OF SEALANT!)
4. INSERT REPAIR SKIN INTO EXTRUSION.
5. INSTALL SPACER BETWEEN REPAIR SKIN AND EXTRUSION.
6. DRILL AND COUNTERSINK HOLES AND RIVET INTO PLACE.



**FIGURE 4.4C: MODEL 3730/3900/4000/6000/6100 AND 8000 TYPICAL REPAIR BOTTOM SKIN TO KEEL (ALT) INSTRUCTIONS (ALTERNATE METHOD)**

- 1. REMOVE ORIGINAL DAMAGED SKIN LEAVING APPROXIMATELY 1 1/2" OF SKIN PROTRUDING FROM EXTRUSION.**
- 2. REMOVE CAULKING FROM GROOVE IN EXTRUSION.**
- 3. INSTALL SEALANT IN GROOVE. (BE SURE TO USE PLENTY OF SEALANT!)**
- 4. INSERT REPAIR SKIN IN GROOVE APPROXIMATELY 1/4".**
- 5. LAYOUT HOLE PATTERN, DRILL, DE-CHIP, SEAL AND RIVET.**

## **5.0 FLOAT HULL EXTRUSIONS**

Extrusions in the float hull are formed from 6061-T6 or 6061-T4 aluminum alloy. See individual repair figures in this section (Section 5.0) for materials used in each repair. Pieces of extrusions may be purchased from Wipaire in full or desired lengths. Internal splice pieces for repairs may be purchased from Wipaire or fabricated per the figures in this section.

There are many ways to repair Wipline floats and each method depends on the degree and location of the damage. The following figures are examples of some repairs. Any repair to the hull not shown in this manual to be per FAA Advisory Circular 43.13.1A.

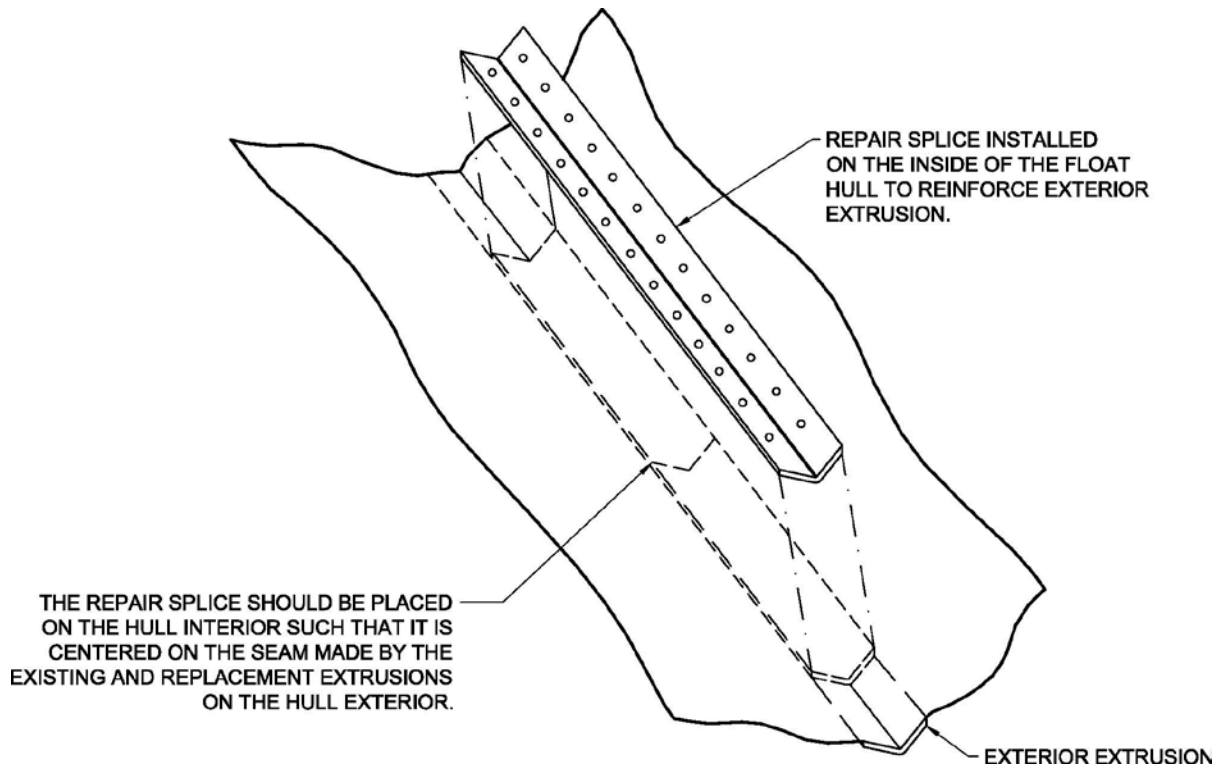
### **5.1 2100/2350 FLOAT EXTRUSION REPAIRS**

#### **5.1.1 SIMPLE EXTRUSION SPLICE REPAIR**

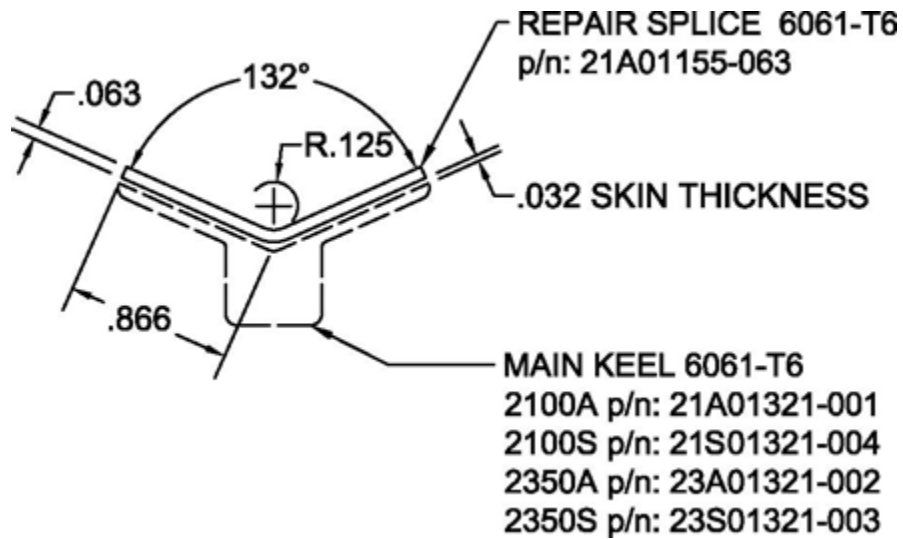
The most used and simplest repair is a splice of an extrusion that is a simple one bend angle where the skins attach to each flange. Figure 5.1-1 depicts the general method of this splice repair. The replacement extrusion can be purchased from Wipaire, or in some cases, fabricated per the figures in this section. The internal splices may either be purchased from Wipaire or fabricated per the figures in this section. Consult the Table of Contents at the beginning of this manual to locate applicable figures for your repair.

Repair Process:

1. Remove rivets (if applicable) about 6-8" on either end of the area to be repaired.
2. Mark damaged area to be removed.
  - a. Be sure to start and end spliced area in the centers of the float bays to prevent interference with the bulkheads or bottom stiffeners.
3. Cut out damaged section being careful NOT to cut into the skins.
4. Obtain new extrusion from Wipaire Parts Department. Cut the repair section from the new extrusion in the exact area of the damage.
5. File to remove rough edges.
6. See Section 3.0 of this manual for appropriate fastener options.
7. Add internal splices, making sure the repair seam is located in the middle of the splice, and that the splice is centered between the bulkheads.
8. Use existing piece to back drill holes for attachment making sure the distance from the end of the splice to the center of the first hole is greater than or equal to 2 times the diameter of the rivet used.



**FIGURE 5.1-1: SIMPLE EXTRUSION SPLICE REPAIR**



**FIGURE 5.1-2: 2100/2350 MAIN KEEL REPAIR**



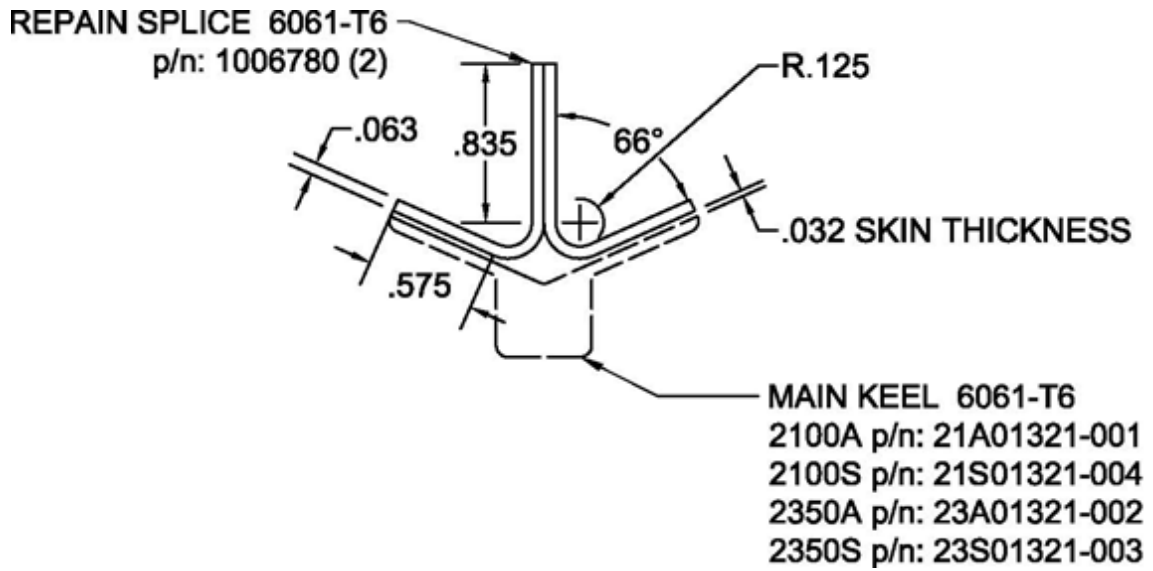


FIGURE 5.1-3: 2100/2350 ALTERNATE MAIN KEEL REPAIR

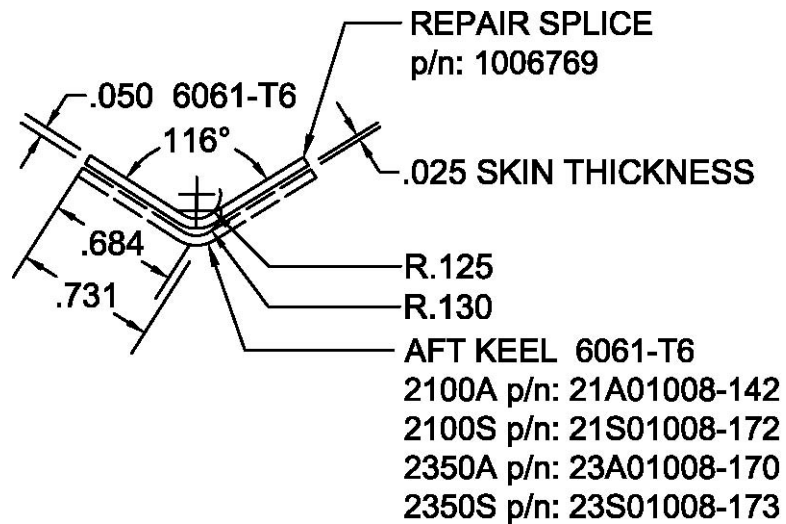


FIGURE 5.1-4: 2100/2350 AFT KEEL REPAIR

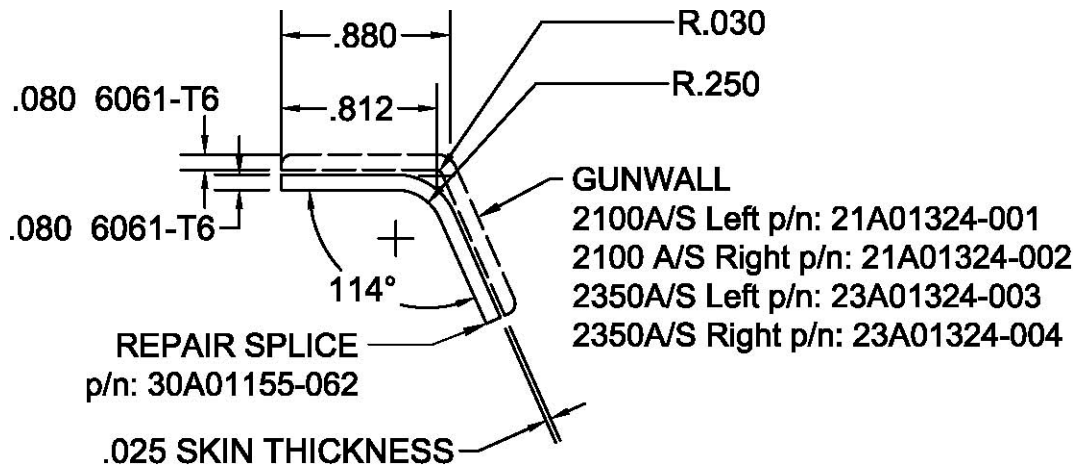


FIGURE 5.1-5: 2100/2350 GUNWALL REPAIR

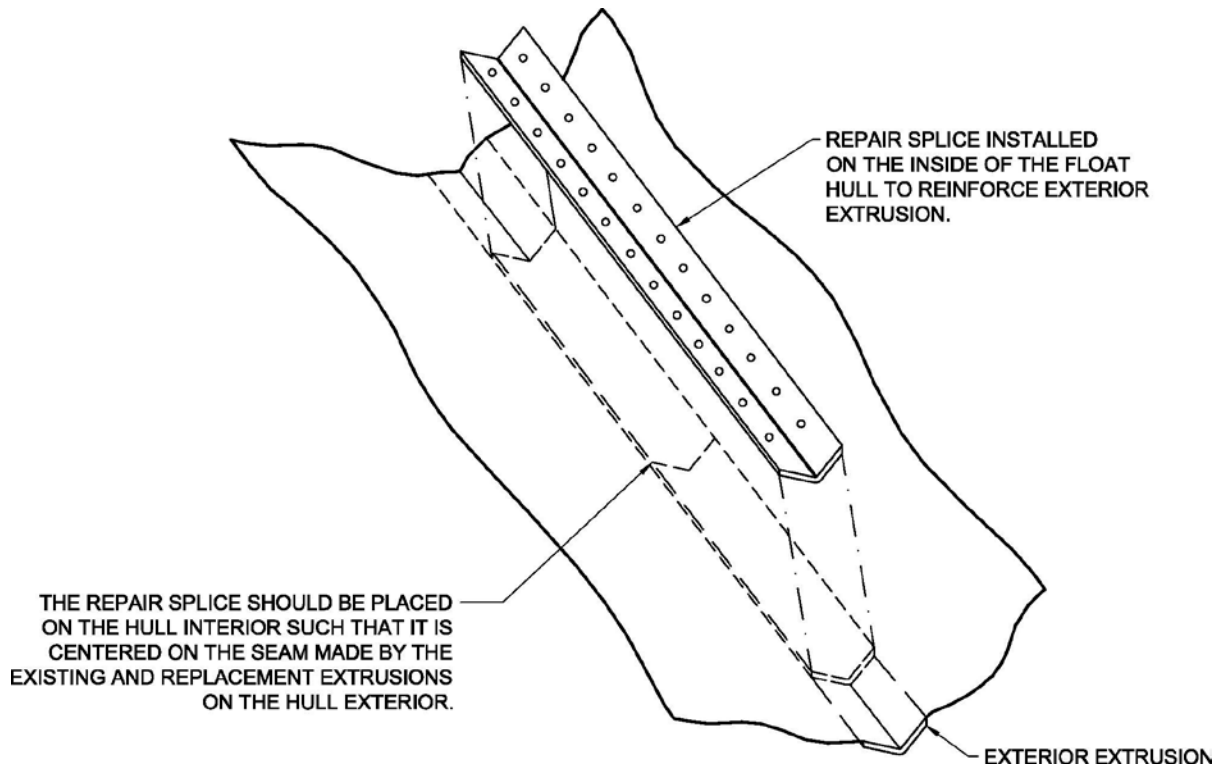
## **5.2 3000/3450 FLOAT EXTRUSION REPAIRS**

### **5.2.1 SIMPLE EXTRUSION SPLICE REPAIR**

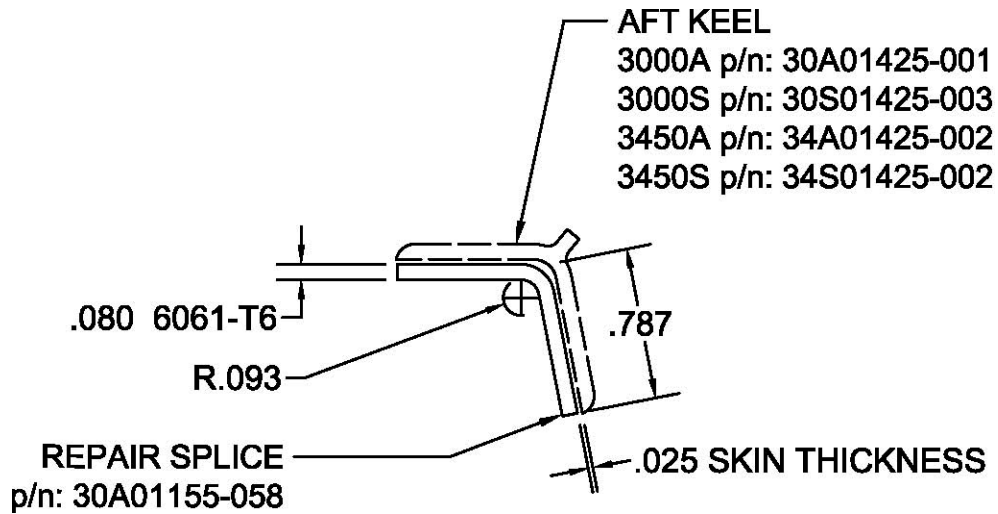
The most used and simplest repair is a splice of an extrusion that is a simple one bend angle where the skins attach to each flange. Figure 5.2-1 depicts the general method of this splice repair. The replacement extrusion can be purchased from Wipaire, or in some cases, fabricated per the figures in this section. The internal splices may either be purchased from Wipaire or fabricated per the figures in this section. Consult the Table of Contents at the beginning of this manual to locate applicable figures for your repair.

#### Repair Process:

1. Remove rivets (if applicable) about 6-8" on either end of the area to be repaired.
2. Mark damaged area to be removed.
  - a. Be sure to start and end spliced area in the centers of the float bays to prevent interference with the bulkheads or bottom stiffeners.
3. Cut out damaged section being careful NOT to cut into the skins.
4. Obtain new extrusion from Wipaire Parts Department. Cut the repair section from the new extrusion in the exact area of the damage.
5. File to remove rough edges.
6. See Section 3.0 of this manual for appropriate fastener options.
7. Add internal splices, making sure the repair seam is located in the middle of the splice, and that the splice is centered between the bulkheads.
8. Use existing piece to back drill holes for attachment making sure the distance from the end of the splice to the center of the first hole is greater than or equal to 2 times the diameter of the rivet used.



**FIGURE 5.2-1: SIMPLE EXTRUSION SPLICE REPAIR**



**FIGURE 5.2-2: 3000/3450 AFT KEEL REPAIR**

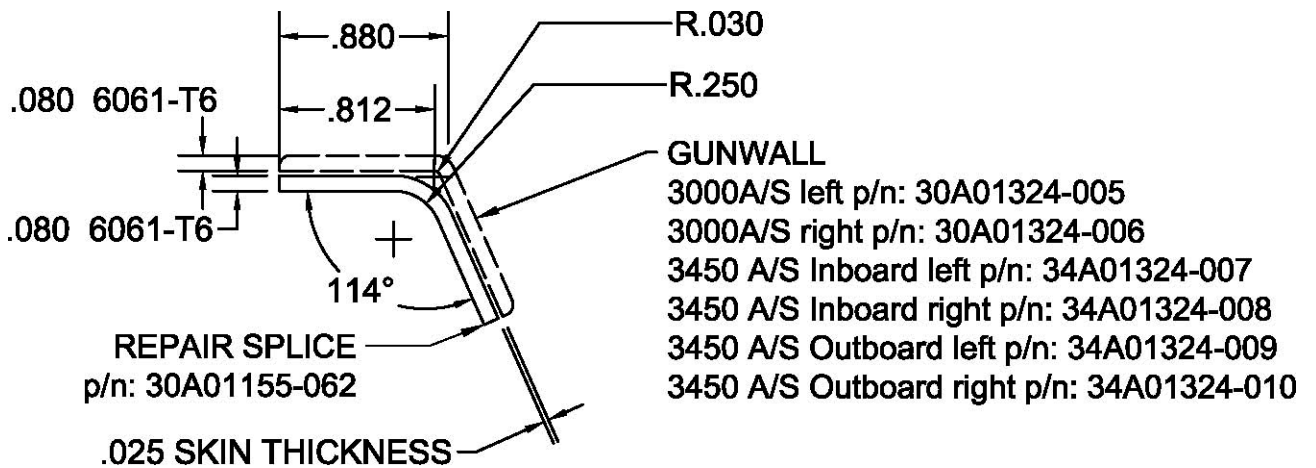


FIGURE 5.2-3: 3000/3450 GUNWALL REPAIR

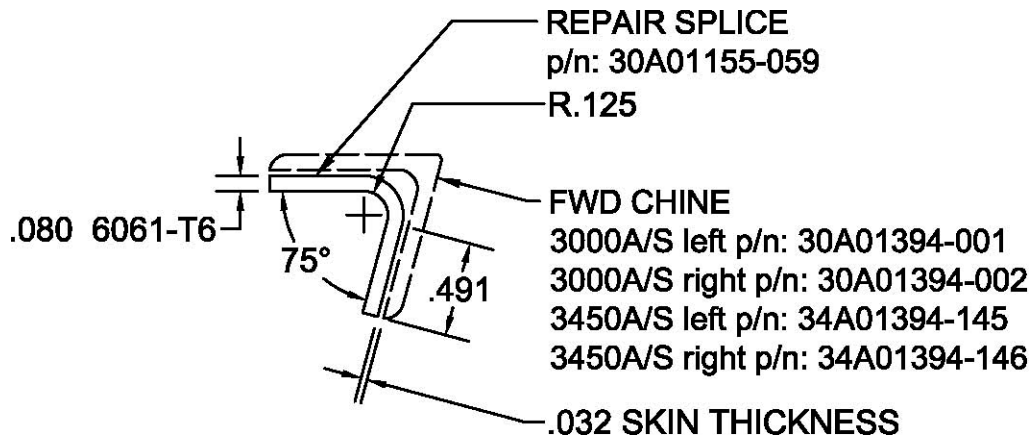
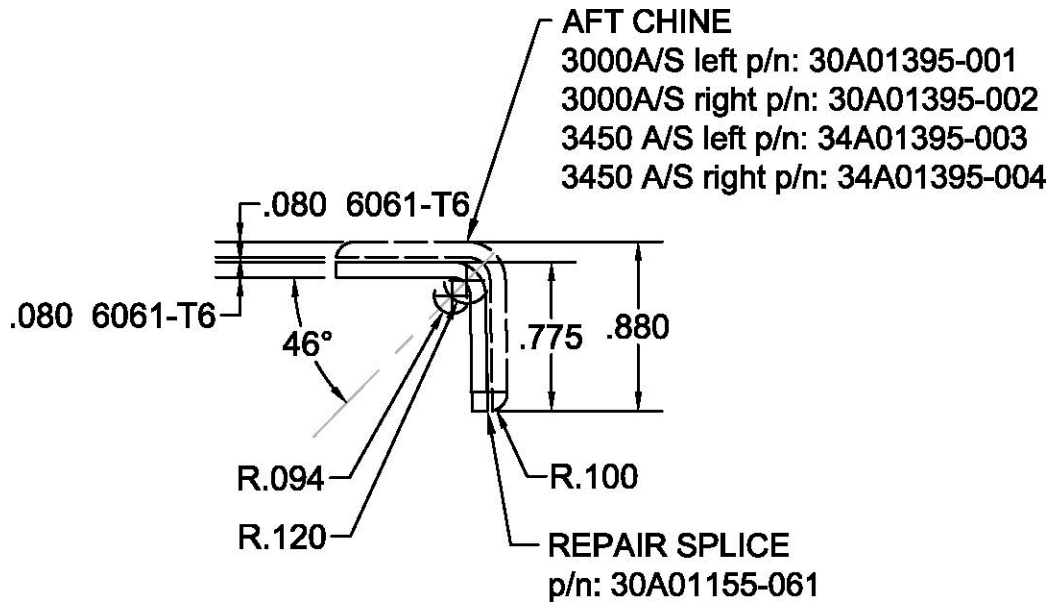


FIGURE 5.2-4: 3000/3450 FWD CHINE REPAIR



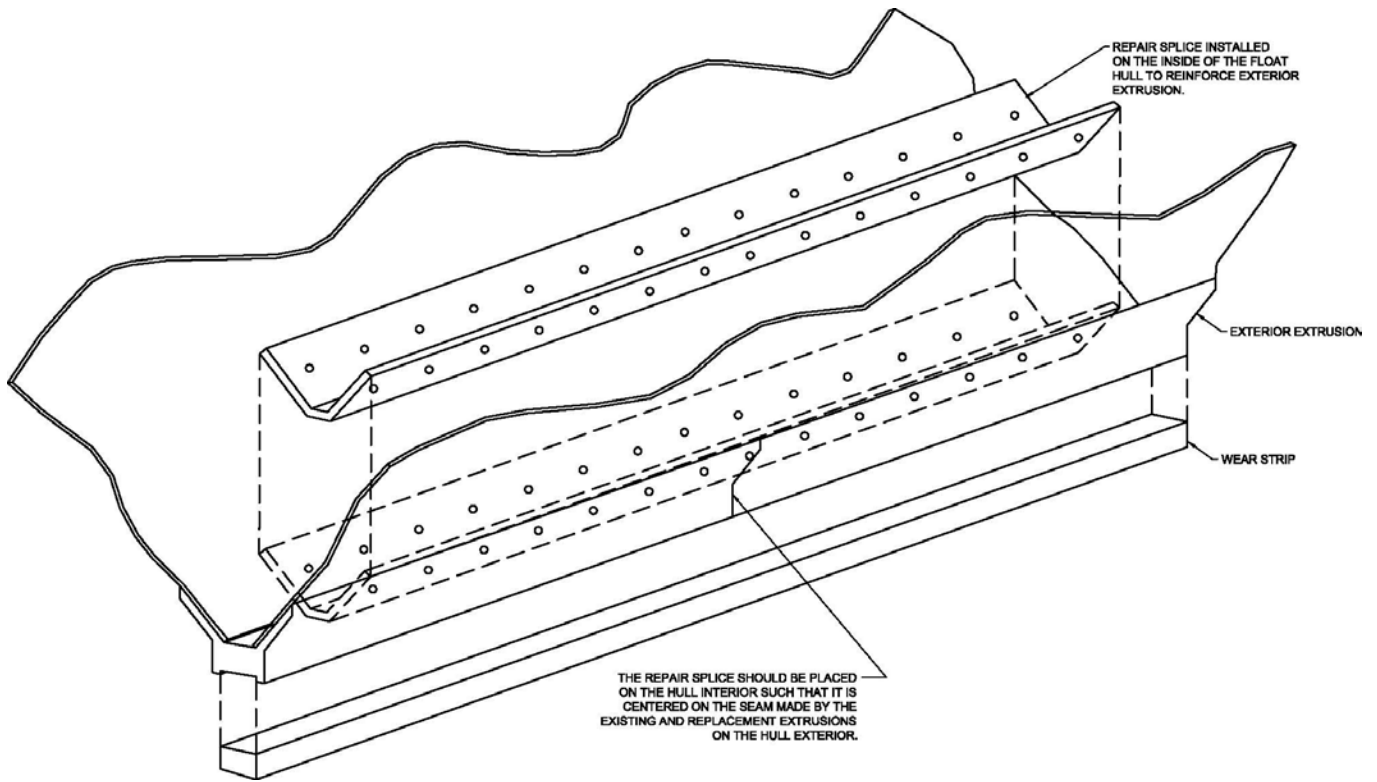
**FIGURE 5.2-5: 3000/3450 AFT CHINE REPAIR**

### 5.2.2 MAIN KEEL EXTRUSION SPLICE REPAIR

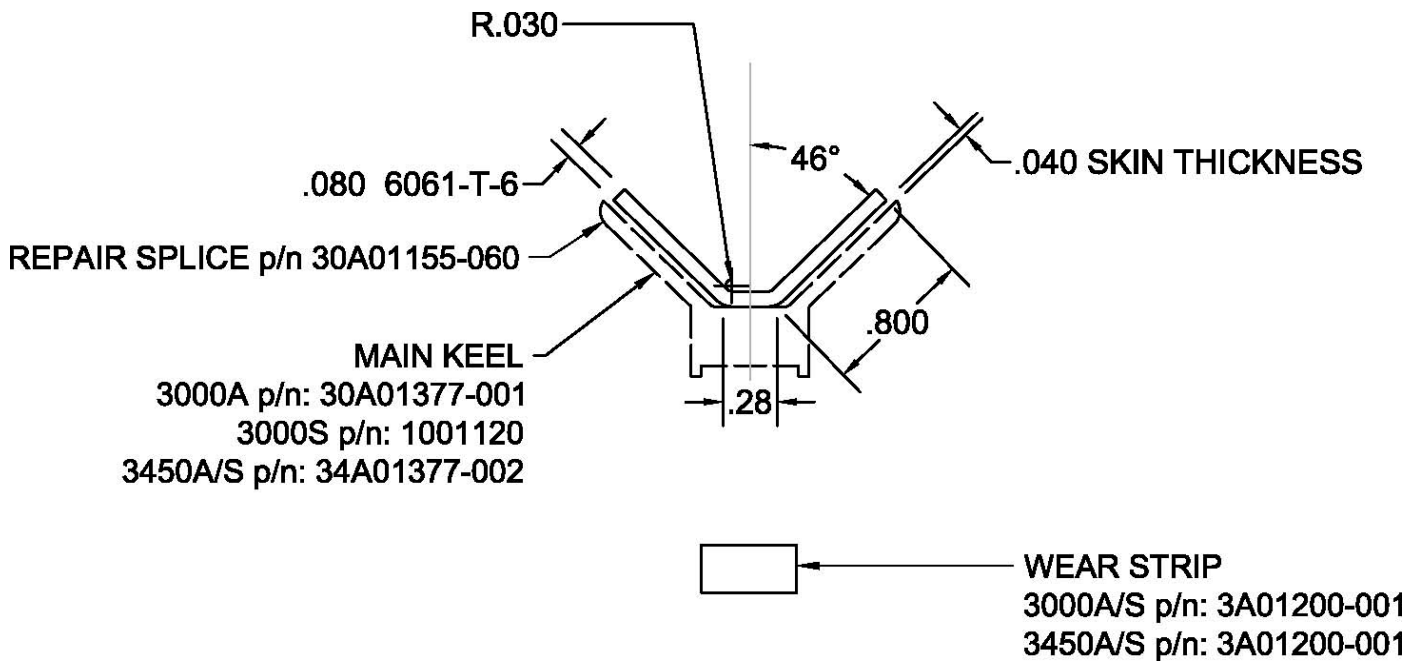
On several float models, the main keel will have a flat bottom with an attached wear strip that must be replaced when repairs are made. Figure 5.2-6 depicts the general method of this splice repair. The replacement extrusion can be purchased from Wipaire, and the internal splices may either be purchased from Wipaire or fabricated per the figures in this section. Consult the Table of Contents at the beginning of this manual to locate applicable figures for your repair.

#### Repair Process:

1. Remove entire wear strip. Purchase new Wear Strip from Wipaire (3A01200-001).
2. Remove rivets (if applicable) about 6-8" on either end of the area to be repaired.
3. Mark damaged area to be removed.
  - a. Be sure to start and end spliced area in the centers of the float bays to prevent interference with the bulkheads or bottom stiffeners.
4. Cut out damaged section being careful NOT to cut into the skins.
5. Obtain new extrusion from Wipaire Parts Department (30A01377-001 or 34A01377-002), and cut out the repair section from the new extrusion in the exact area of the damage.
6. File to remove rough edges.
7. See Section 3.0 of this manual for appropriate fastener options.
8. Add internal splices making sure the repair seam is located in the middle of the splice.
9. Install the new wear strip.
  - a. Position wear strip over main keel
  - b. Drill #29 dia. hole close to each end and between each bulkhead (use old wear strip for approximate locations).
  - c. Tap main keel to 8-32 thru
  - d. Drill wear strip to #17 dia. hole and c'sink 100°
  - e. Apply float sealant 892 BR between strip and keel.
  - f. Secure strip to keel with AN507C832-8 screws, AN960-8 washers, and AN365-832 nuts.



**FIGURE 5.2-6: MAIN KEEL SIMPLE EXTRUSION SPLICE REPAIR**



**FIGURE 5.2-7: 3000/3450 MAIN KEEL REPAIR**

## 5.3 3730/3900 FLOAT EXTRUSION REPAIRS

### 5.3.1 SIMPLE EXTRUSION SPLICE REPAIR

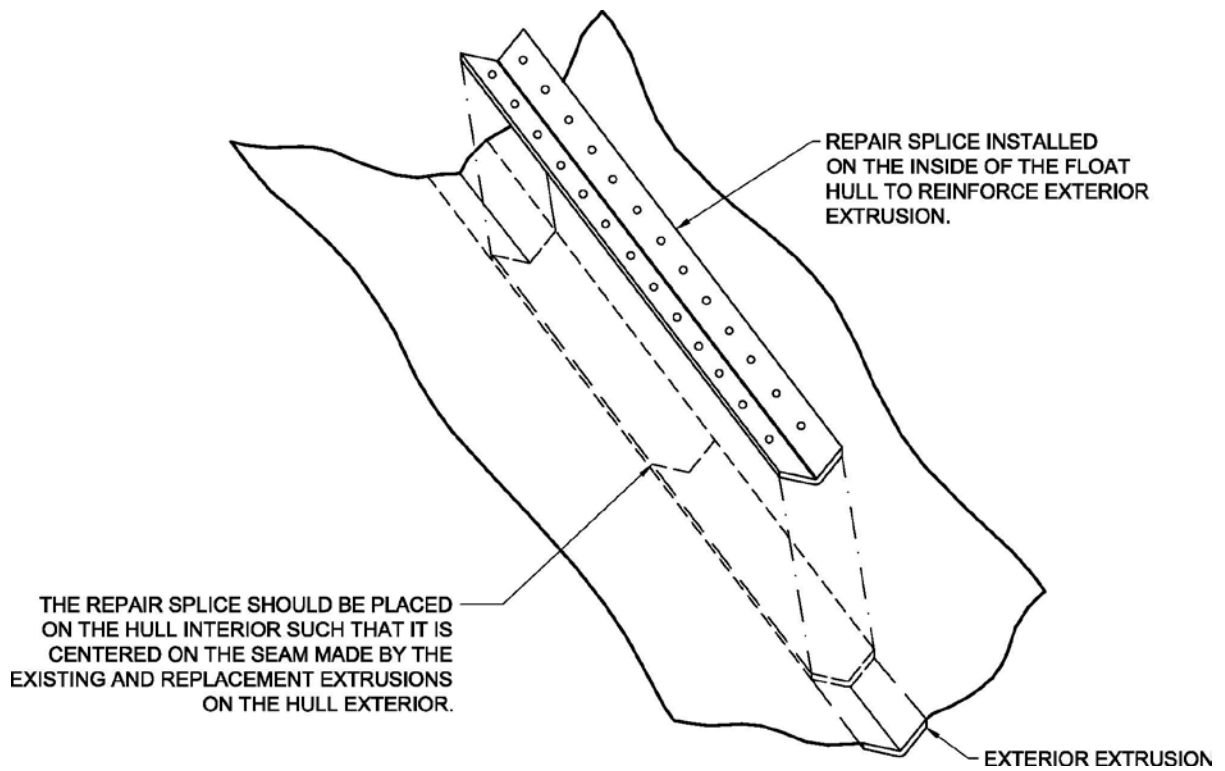
The most used and simplest repair is a splice of an extrusion that is a simple one bend angle where the skins attach to each flange. Figure 5.3-1 depicts the general method of this splice repair. The replacement extrusion can be purchased from Wipaire, or in some cases, fabricated per the figures in this section. The internal splices may either be purchased from Wipaire or fabricated per the figures in this section. Consult the Table of Contents at the beginning of this manual to locate applicable figures for your repair.

#### Repair Process:

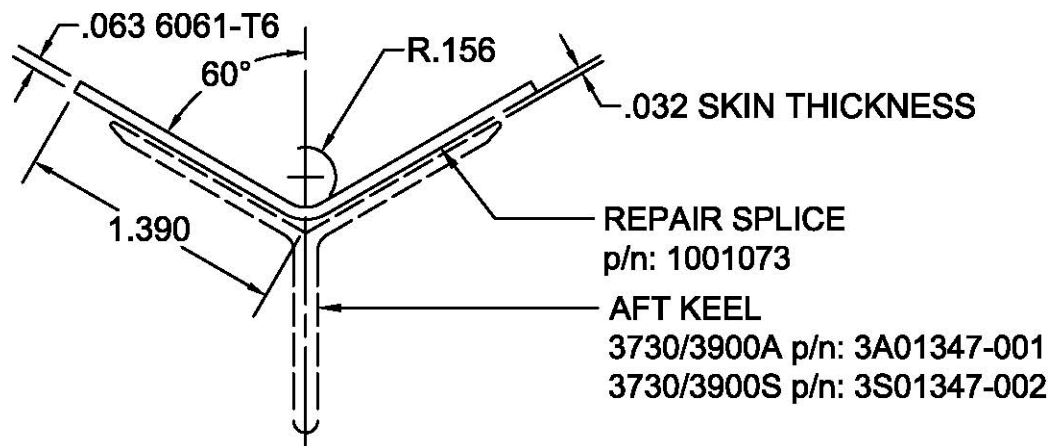
1. Remove rivets (if applicable) about 6-8" on either end of the area to be repaired.
2. Mark damaged area to be removed.
  - a. Be sure to start and end spliced area in the centers of the float bays to prevent interference with the bulkheads or bottom stiffeners.
3. Cut out damaged section being careful NOT to cut into the skins.
4. Obtain new extrusion from Wipaire Parts Department. Cut the repair section from the new extrusion in the exact area of the damage.
5. File to remove rough edges.
6. See Section 3.0 of this manual for appropriate fastener options.
7. Add internal splices, making sure the repair seam is located in the middle of the splice, and that the splice is centered between the bulkheads.

Use existing piece to back drill holes for attachment making sure the distance from the end of the splice to the center of the first hole is greater than or equal to 2 times the diameter of the rivet used.





**FIGURE 5.3-1: SIMPLE EXTRUSION SPLICE REPAIR**



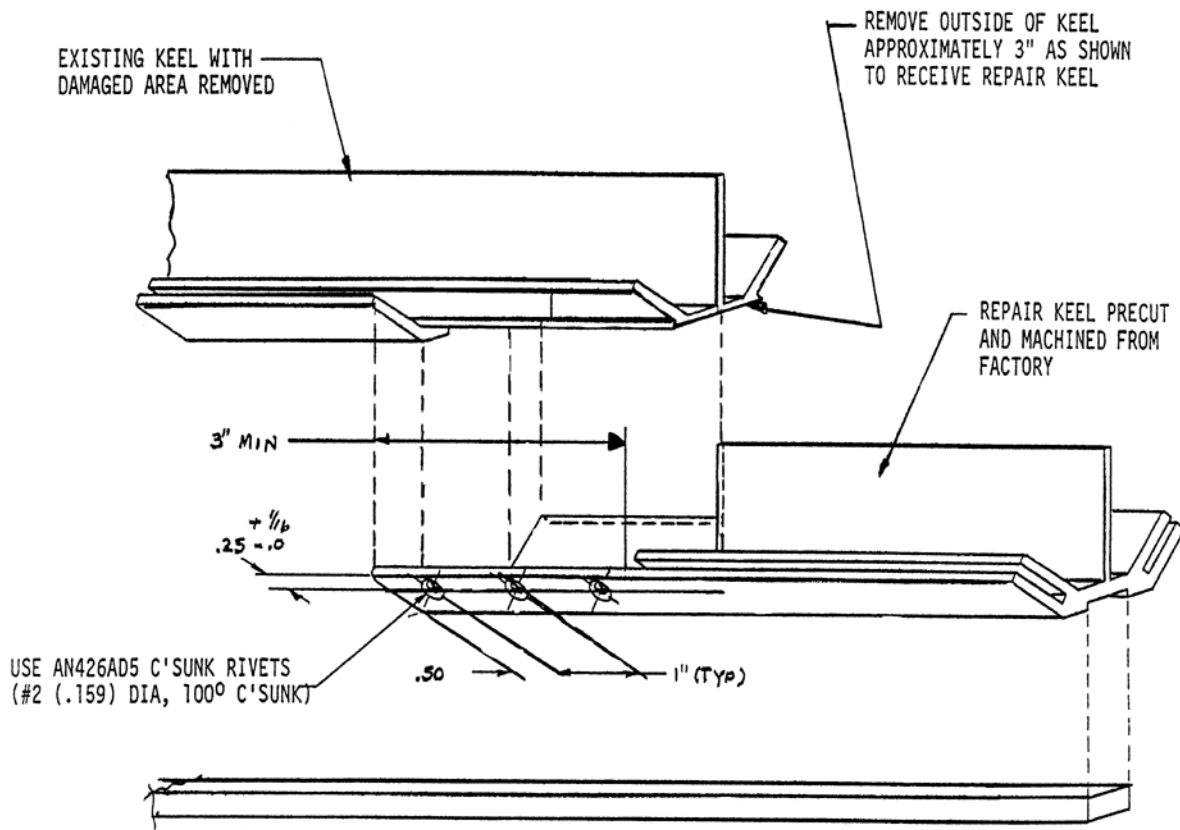
**FIGURE 5.3-2: 3730/3900 AFT KEEL REPAIR**

### 5.3.2 COMPLEX EXTRUSION SPLICE REPAIR

The 3730/3900, 4000, 6000, and 8000 float models utilize complex extrusions with channels on each flange into which the skins are inserted. Figure 5.3-3 depicts the general method of this splice repair. The replacement extrusions and wear strips can be purchased from the Wipaire Parts Department. Consult Table 5.3-1 below to locate applicable part numbers for your repair.

#### Repair Process:

1. Remove the damaged area. On the remaining extrusion, cut out 3" of the outer layer of the extrusion as shown in Figure 5.3-3 so it can receive the repair piece.
2. Purchase the repair part from Wipaire. The repair part will be pre-cut and machined from the factory so only the outside layer of the extrusion remains for 3" at the end and the repair piece will notch together with the existing keel.
3. Fasten the 2 pieces together in the overlapping area using AN426AD5 c'sunk rivets spaced per Figure 5.3-3.
4. If repairing the Main Keel, finish repair by installing a new Wear Strip which can be purchased from Wipaire.
  - a. Position wear strip over main keel
  - b. Drill #29 dia. hole close to each end and between each bulkhead (use old wear strip for approx. locations).
  - c. Tap main keel to 8-32 thru
  - d. Drill wear strip to #17 dia hole and c'sink 100°
  - e. Apply float sealant 892 BR between strip and keel.
  - f. Secure strip to keel with AN507C832-8 screws, AN960-8 washers, and AN365-832 nuts.



**FIGURE 5.3-3: COMPLEX EXTRUSION SPLICE REPAIR**

<b>Main Keel</b>	3A01354-001 (A) 3A01354-002 (S)
<b>Wear Strip</b>	3A01200-001
<b>Sister Keel (outer)</b>	3A01342-001 (left) 3A01342-002 (right)
<b>Fwd Chine</b>	3A01351-001 (left) 3A01351-002 (right)
<b>Aft Chine</b>	3A01363-001 (left) 3A01363-002 (right)
<b>Gunwall</b>	3A01366-001 (left) 3A01366-002 (right)

**TABLE 5.3-1 3730/3900 COMPLEX EXTRUSION REPLACEMENT PARTS**

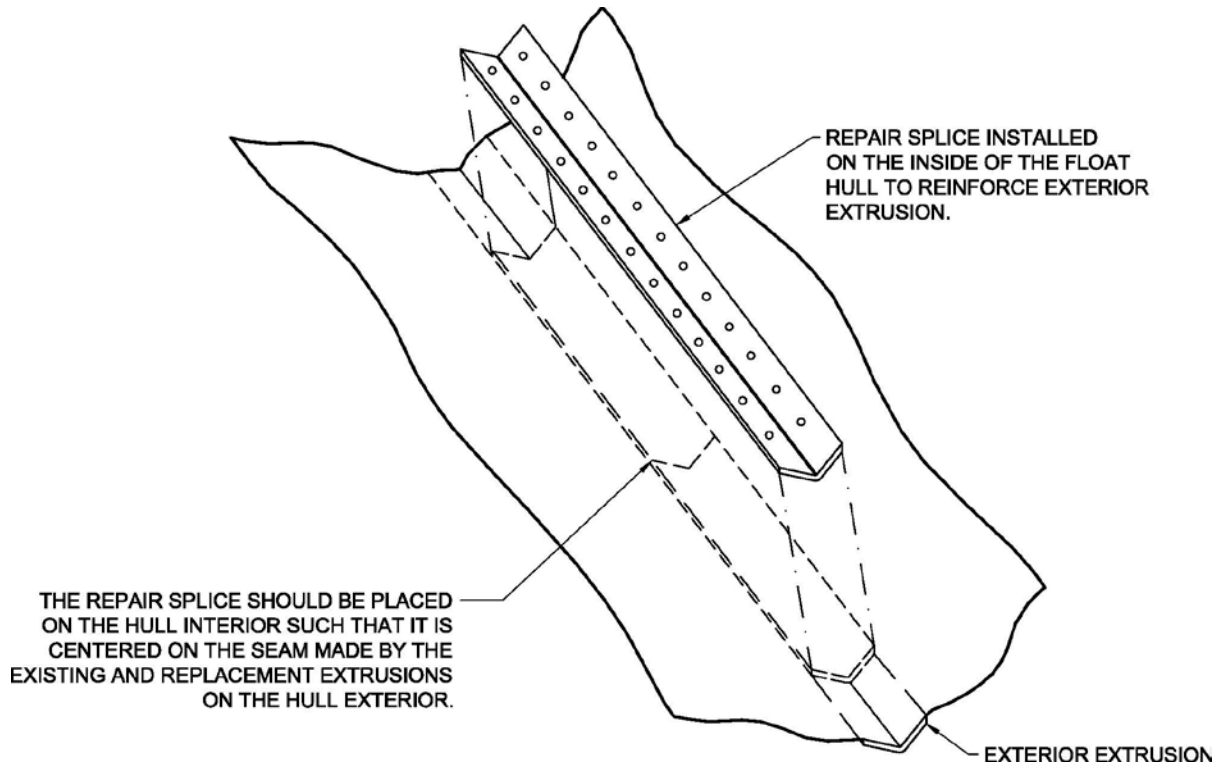
## 5.4 4000 FLOAT EXTRUSION REPAIRS

### Simple Extrusion Splice Repair

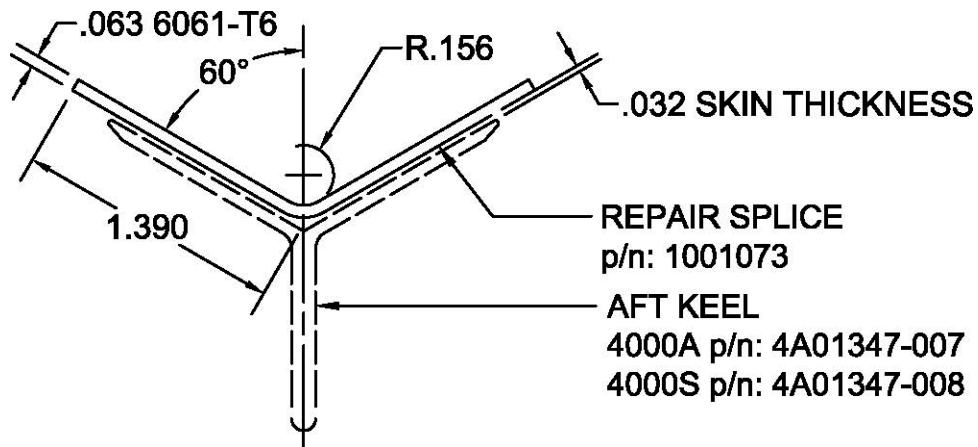
The most used and simplest repair is a splice of an extrusion that is a simple one bend angle where the skins attach to each flange. Figure 5.4-1 depicts the general method of this splice repair. The replacement extrusion can be purchased from Wipaire, or in some cases, fabricated per the figures in this section. The internal splices may either be purchased from Wipaire or fabricated per the figures in this section. Consult the Table of Contents at the beginning of this manual to locate applicable figures for your repair.

#### Repair Process:

1. Remove rivets (if applicable) about 6-8" on either end of the area to be repaired.
2. Mark damaged area to be removed.
  - a. Be sure to start and end spliced area in the centers of the float bays to prevent interference with the bulkheads or bottom stiffeners.
3. Cut out damaged section being careful NOT to cut into the skins.
4. Obtain new extrusion from Wipaire Parts Department. Cut the repair section from the new extrusion in the exact area of the damage.
5. File to remove rough edges.
6. See Section 3.0 of this manual for appropriate fastener options.
7. Add internal splices, making sure the repair seam is located in the middle of the splice, and that the splice is centered between the bulkheads.
8. Use existing piece to back drill holes for attachment making sure the distance from the end of the splice to the center of the first hole is greater than or equal to 2 times the diameter of the rivet used.



**FIGURE 5.4-1: SIMPLE EXTRUSION SPLICE REPAIR**



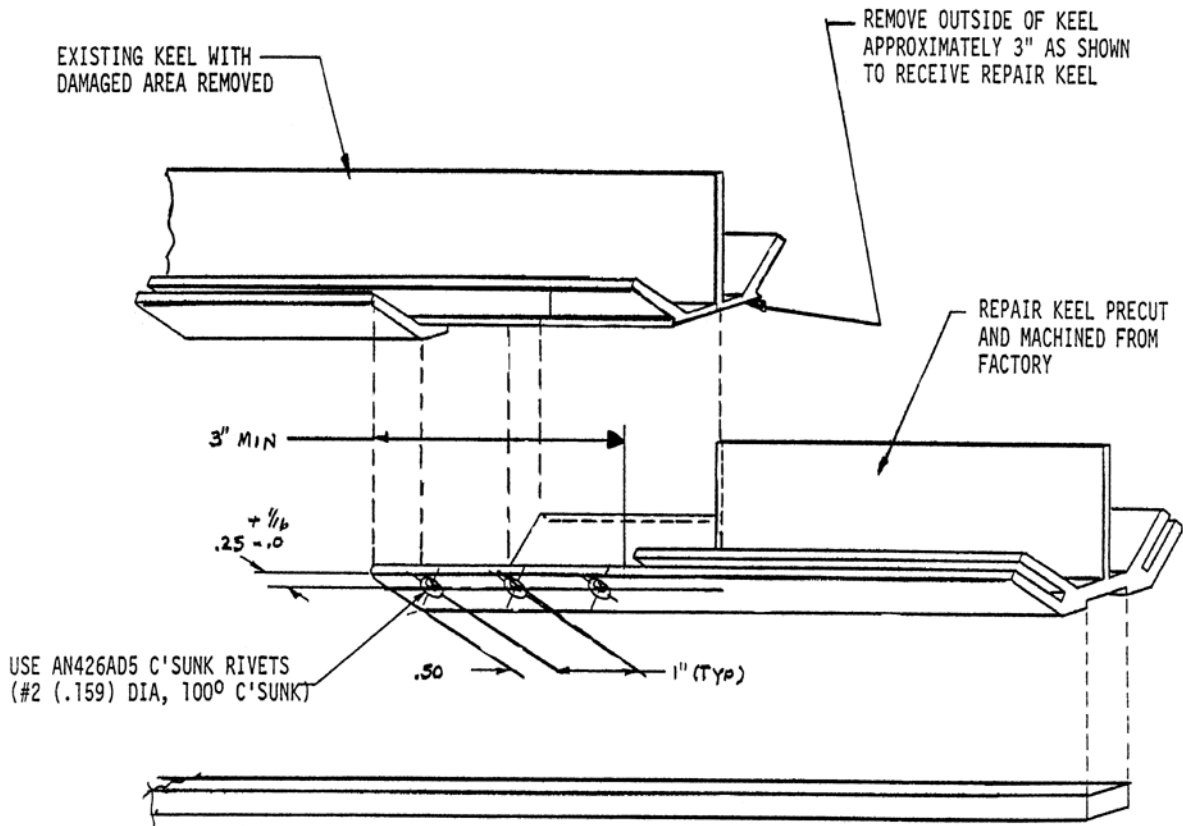
**FIGURE 5.4-2: 4000 AFT KEEL REPAIR**

#### 5.4.2 COMPLEX EXTRUSION SPLICE REPAIR

The 3730/3900, 4000, 6000, and 8000 float models utilize complex extrusions with channels on each flange into which the skins are inserted. Figure 5.4-3 depicts the general method of this splice repair. The replacement extrusions and wear strips can be purchased from the Wipaire Parts Department. Consult Table 5.4-1 below to locate applicable part numbers for your repair.

##### Repair Process:

1. Remove the damaged area. On the remaining extrusion, cut out 3" of the outer layer of the extrusion as shown in Figure 5.4-3 so it can receive the repair piece.
2. Purchase the repair part from Wipaire. The repair part will be pre-cut and machined from the factory so only the outside layer of the extrusion remains for 3" at the end and the repair piece will notch together with the existing keel.
3. Fasten the 2 pieces together in the overlapping area using AN426AD5 c'sunk rivets spaced per Figure 5.4-3.
4. If repairing the Main Keel, finish repair by installing a new Wear Strip which can be purchased from Wipaire.
  - a. Position wear strip over main keel
  - b. Drill #29 dia. hole close to each end and between each bulkhead (use old wear strip for approx. locations).
  - c. Tap main keel to 8-32 thru
  - d. Drill wear strip to #17 dia hole and c'sink 100°
  - e. Apply float sealant 892 BR between strip and keel.
  - f. Secure strip to keel with AN507C832-8 screws, AN960-8 washers, and AN365-832 nuts.



**FIGURE 5.4-3: COMPLEX EXTRUSION SPLICE REPAIR**

<b>Main Keel</b>	4A01354-007 (A) 4S01354-008 (S)
<b>Wear Strip</b>	3A01200-001 (A) 6S01200-002 (S)
<b>Sister Keel (outer)</b>	4A01342-008 (left) 4A01342-007 (right)
<b>Fwd Chine</b>	4A01331-001 (left) 4A01331-002 (right)
<b>Aft Chine</b>	4A01332-001 (left) 4A01332-002 (right)
<b>Gunwall</b>	4A01330-001 (left) 4A01330-002 (right)

**TABLE 5.4-1: 4000 COMPLEX EXTRUSION REPLACEMENT PARTS**

## 5.5 6000 FLOAT EXTRUSION REPAIRS

### 5.5.1 SIMPLE EXTRUSION SPLICE REPAIR

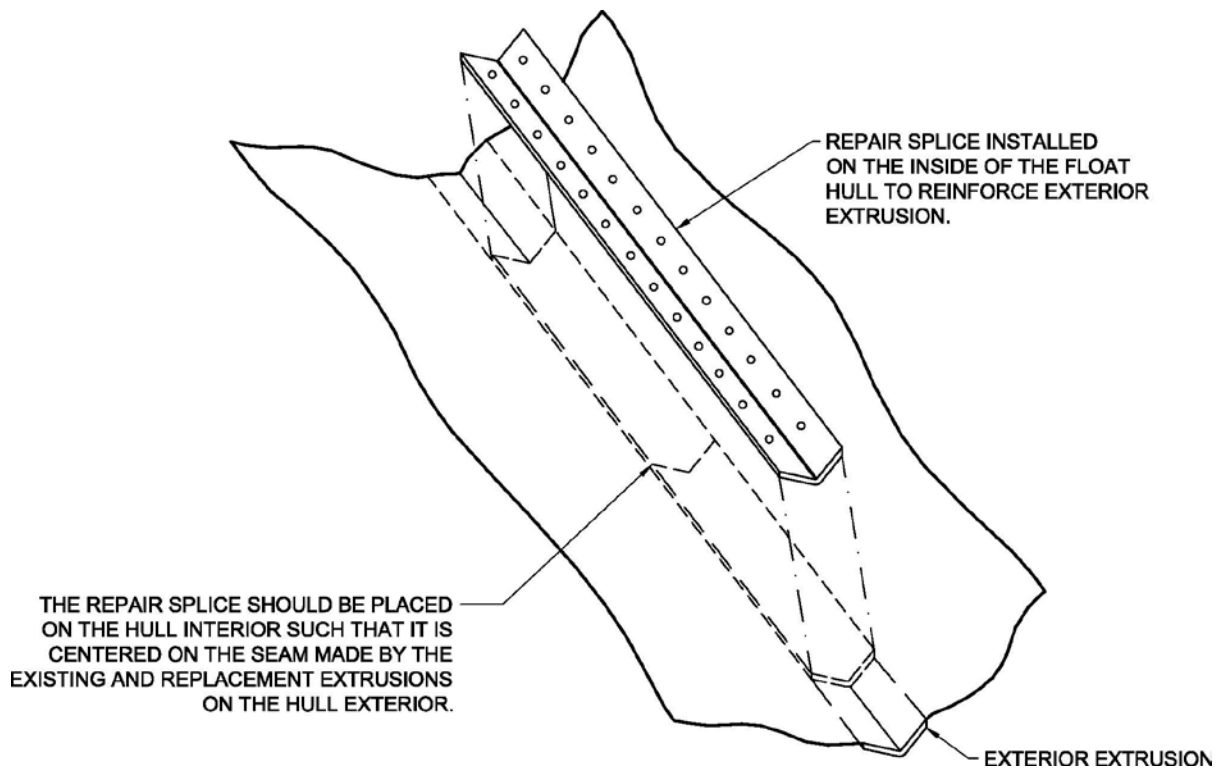
The most used and simplest repair is a splice of an extrusion that is a simple one bend angle where the skins attach to each flange. Figure 5.5-1 depicts the general method of this splice repair. The replacement extrusion can be purchased from Wipaire, or in some cases, fabricated per the figures in this section. The internal splices may either be purchased from Wipaire or fabricated per the figures in this section. Consult the Table of Contents at the beginning of this manual to locate applicable figures for your repair.

Repair Process:

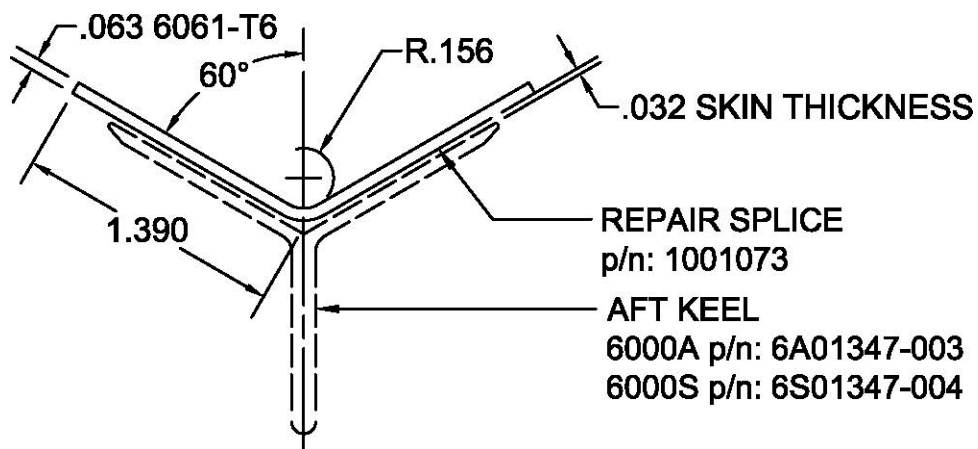
1. Remove rivets (if applicable) about 6-8" on either end of the area to be repaired.
2. Mark damaged area to be removed.
  - a. Be sure to start and end spliced area in the centers of the float bays to prevent interference with the bulkheads or bottom stiffeners.
3. Cut out damaged section being careful NOT to cut into the skins.
4. Obtain new extrusion from Wipaire Parts Department. Cut the repair section from the new extrusion in the exact area of the damage.
5. File to remove rough edges.
6. See Section 3.0 of this manual for appropriate fastener options.
7. Add internal splices, making sure the repair seam is located in the middle of the splice, and that the splice is centered between the bulkheads.

Use existing piece to back drill holes for attachment making sure the distance from the end of the splice to the center of the first hole is greater than or equal to 2 times the diameter of the rivet used.





**FIGURE 5.5-1: SIMPLE EXTRUSION SPLICE REPAIR**



**FIGURE 5.5-2: 6000 AFT KEEL REPAIR**

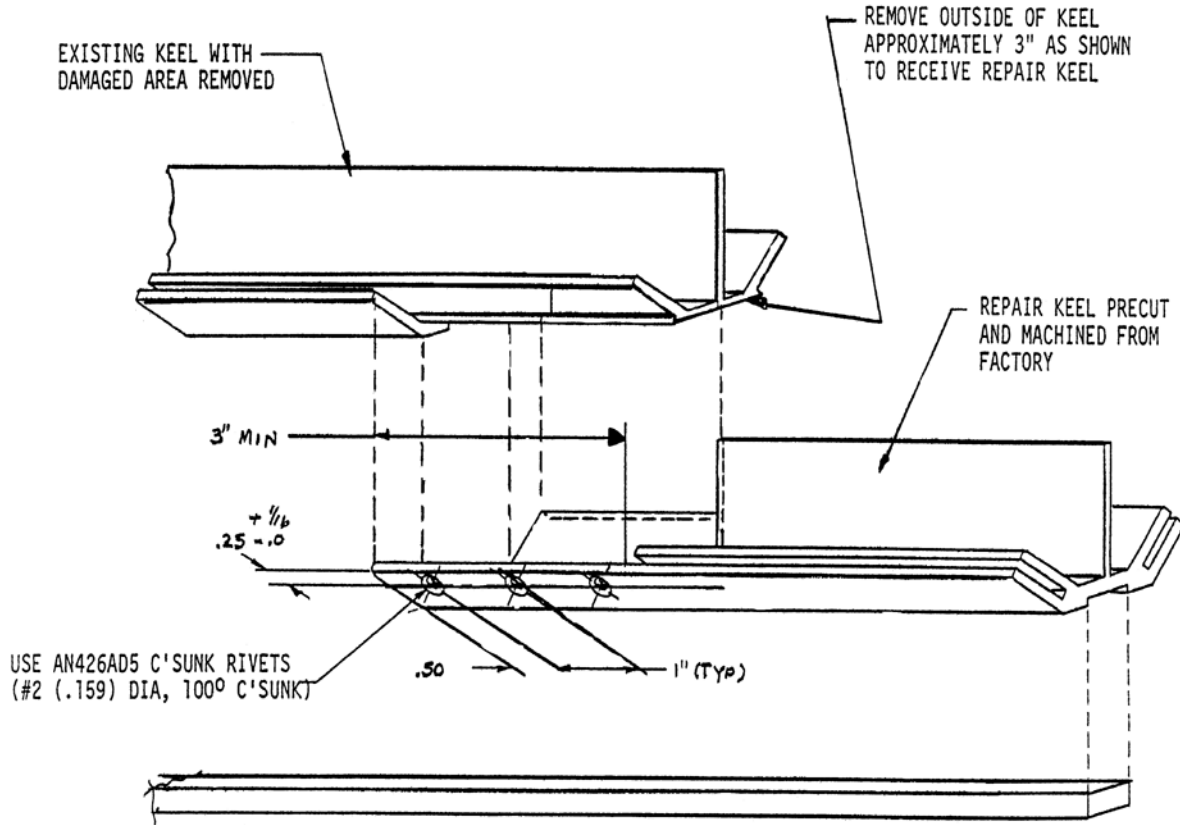
### 5.5.2 COMPLEX EXTRUSION SPLICE REPAIR

The 3730/3900, 4000, 6000, and 8000 float models utilize complex extrusions with channels on each flange into which the skins are inserted. Figure 5.5-3 depicts the general method of this splice repair. The replacement extrusions and wear strips can be purchased from the Wipaire Parts Department. Consult Table 5.5-1 below to locate applicable part numbers for your repair.

#### Repair Process:

1. Remove the damaged area. On the remaining extrusion, cut out 3" of the outer layer of the extrusion as shown in Figure 5.5-3 so it can receive the repair piece.
2. Purchase the repair part from Wipaire. The repair part will be pre-cut and machined from the factory so only the outside layer of the extrusion remains for 3" at the end and the repair piece will notch together with the existing keel.
3. Fasten the 2 pieces together in the overlapping area using AN426AD5 c'sunk rivets spaced per Figure 5.5-3.
4. If repairing the Main Keel, finish repair by installing a new Wear Strip which can be purchased from Wipaire.
  - a. Position wear strip over main keel
  - b. Drill #29 dia. hole close to each end and between each bulkhead (use old wear strip for approx. locations).
  - c. Tap main keel to 8-32 thru
  - d. Drill wear strip to #17 dia hole and c'sink 100°
  - e. Apply float sealant 892 BR between strip and keel.
  - f. Secure strip to keel with AN507C832-8 screws, AN960-8 washers, and AN365-832 nuts.

STRUCTURAL REPAIR MANUAL FOR WIPLINE ALUMINUM FLOATS



**FIGURE 5.5-3: COMPLEX EXTRUSION SPLICE REPAIR**

<b>Main Keel</b>	6A01354-003 (A) 6S01354-004 (S)
<b>Wear Strip</b>	3A01200-001 (A)
<b>Sister Keel (outer)</b>	6A01342-003 (left) 6A01342-004 (right)
<b>Fwd Chine</b>	6A01351-003 (left) 6A01351-004 (right)
<b>Aft Chine</b>	6A01363-003 (left) 6A01363-004 (right)
<b>Gunwall</b>	8A01366-005 (left) 8A01366-006 (right)

**TABLE 5.5-1: 6000 COMPLEX EXTRUSION REPLACEMENT PARTS**

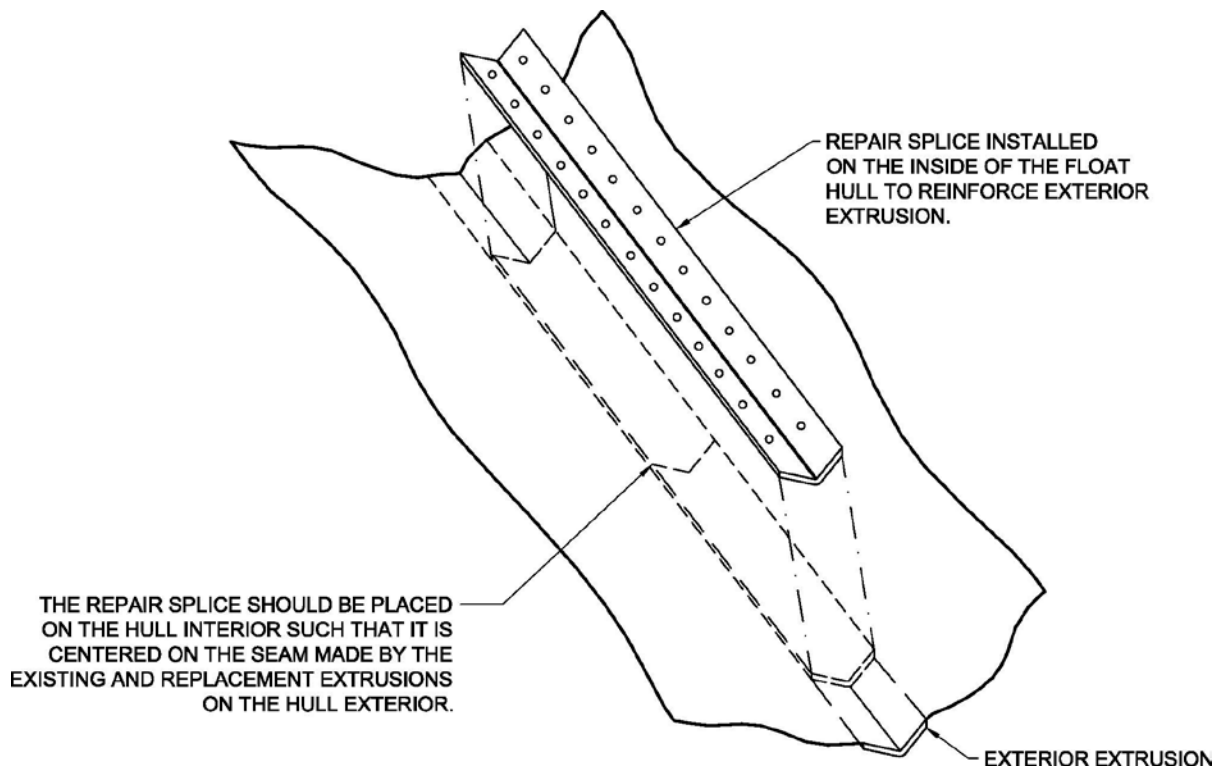
## 5.6 7000 FLOAT EXTRUSION REPAIRS

### 5.6.1 SIMPLE EXTRUSION SPLICE REPAIR

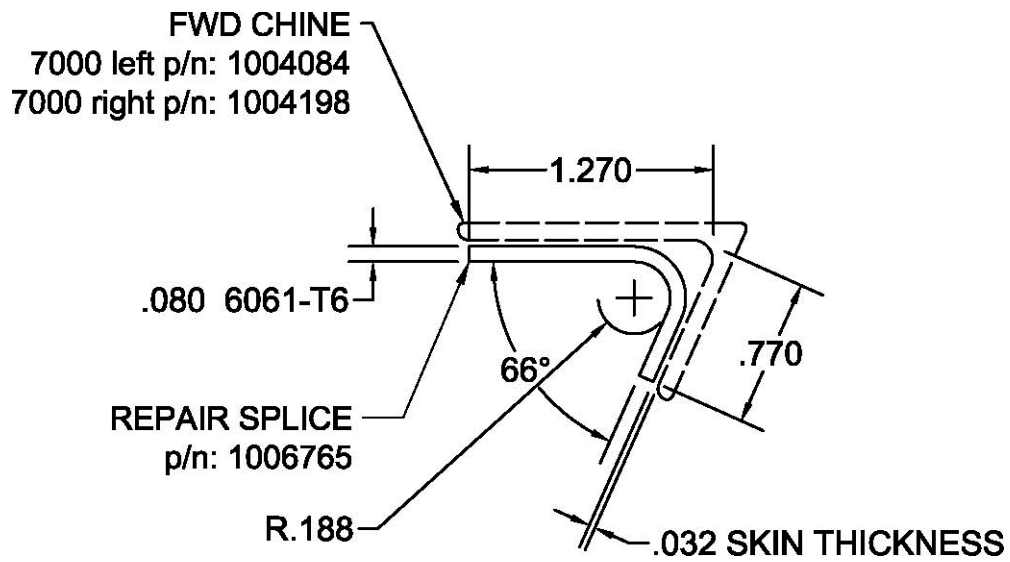
The most used and simplest repair is a splice of an extrusion that is a simple one bend angle where the skins attach to each flange. Figure 5.6-1 depicts the general method of this splice repair. The replacement extrusion can be purchased from Wipaire, or in some cases, fabricated per the figures in this section. The internal splices may either be purchased from Wipaire or fabricated per the figures in this section. Consult the Table of Contents at the beginning of this manual to locate applicable figures for your repair.

#### Repair Process:

1. Remove rivets (if applicable) about 6-8" on either end of the area to be repaired.
2. Mark damaged area to be removed.
  - a. Be sure to start and end spliced area in the centers of the float bays to prevent interference with the bulkheads or bottom stiffeners.
3. Cut out damaged section being careful NOT to cut into the skins.
4. Obtain new extrusion from Wipaire Parts Department. Cut the repair section from the new extrusion in the exact area of the damage.
5. File to remove rough edges.
6. See Section 3.0 of this manual for appropriate fastener options.
7. Add internal splices, making sure the repair seam is located in the middle of the splice, and that the splice is centered between the bulkheads.
8. Use existing piece to back drill holes for attachment making sure the distance from the end of the splice to the center of the first hole is greater than or equal to 2 times the diameter of the rivet used.



**FIGURE 5.6-1: SIMPLE EXTRUSION SPLICE REPAIR**



**FIGURE 5.6-2: 7000 FWD CHINE REPAIR**

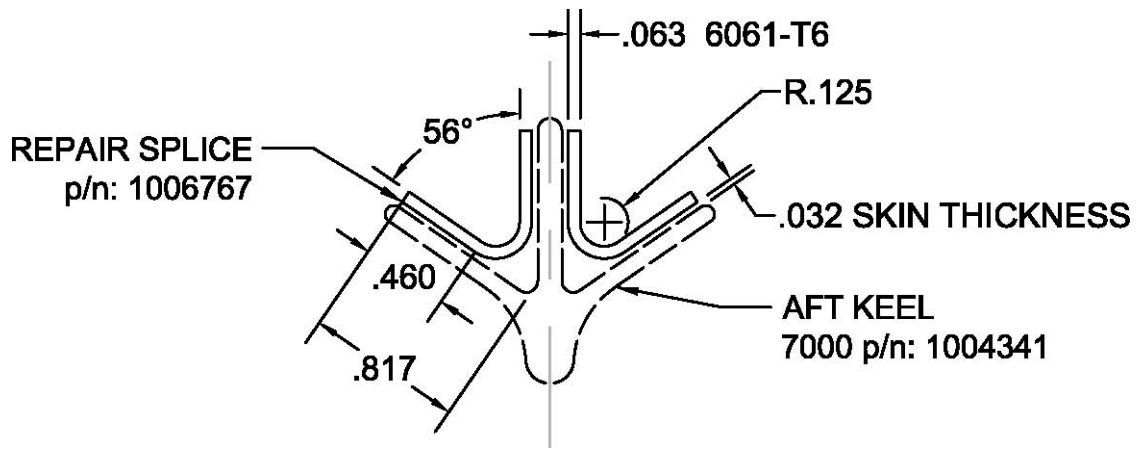


FIGURE 5.6-3: 7000 AFT KEEL REPAIR

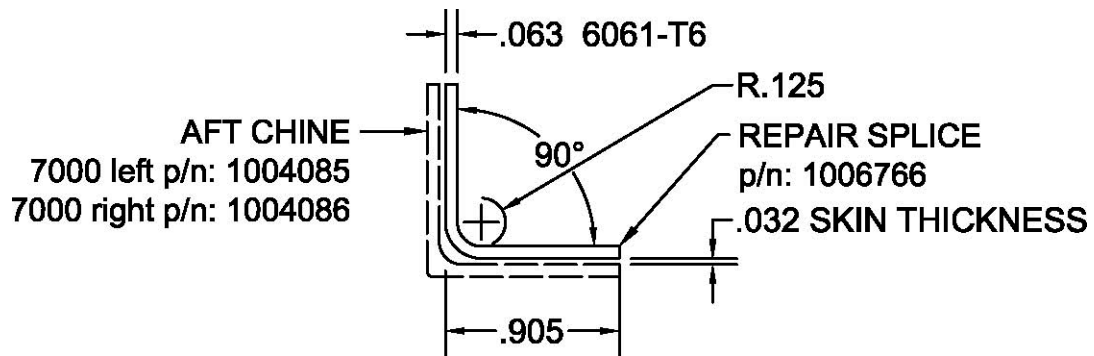


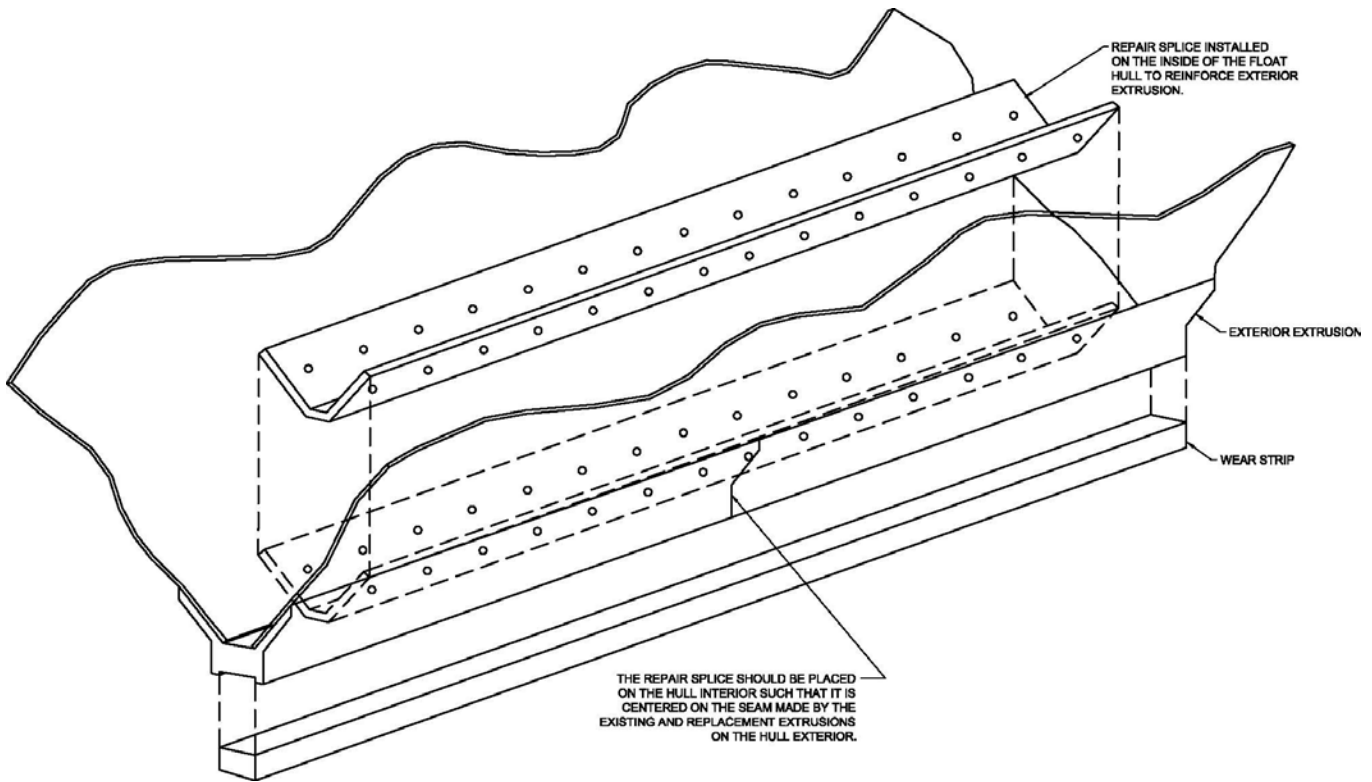
FIGURE 5.6-4: 7000 AFT CHINE REPAIR

### 5.6.2 MAIN KEEL EXTRUSION SPLICE REPAIR

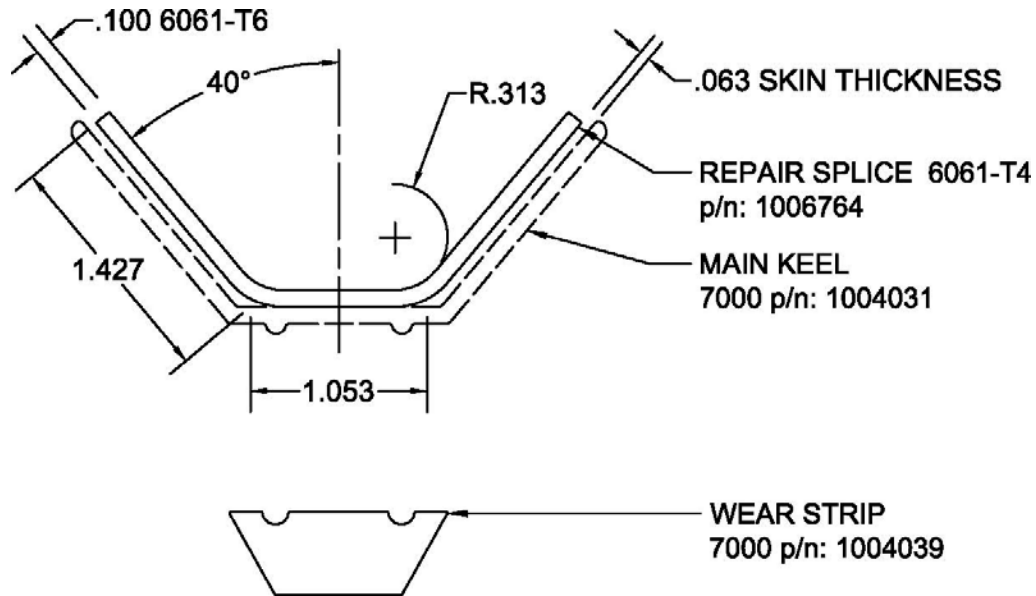
On several float models, the main keel will have a flat bottom with an attached wear strip that must be replaced when repairs are made. Figure 5.6-5 depicts the general method of this splice repair. The replacement extrusion can be purchased from Wipaire, and the internal splices may either be purchased from Wipaire or fabricated per the figures in this section. Consult the Table of Contents at the beginning of this manual to locate applicable figures for your repair.

#### Repair Process:

1. Remove entire wear strip. Purchase new Wear Strip from Wipaire (1004039).
2. Remove rivets (if applicable) about 6-8" on either end of the area to be repaired.
3. Mark damaged area to be removed.
  - a. Be sure to start and end spliced area in the centers of the float bays to prevent interference with the bulkheads or bottom stiffeners.
4. Cut out damaged section being careful NOT to cut into the skins.
5. Obtain new extrusion from Wipaire Parts Department (1004031) and cut out the repair section from the new extrusion in the exact area of the damage.
6. File to remove rough edges.
7. See Section 3.0 of this manual for appropriate fastener options.
8. Add internal splices making sure the repair seam is located in the middle of the splice.
9. Install the new wear strip.
  - a. Position wear strip over main keel
  - b. Drill #29 dia. hole close to each end and between each bulkhead (use old wear strip for approximate locations).
  - c. Tap main keel to 8-32 thru
  - d. Drill wear strip to #17 dia. hole and c'sink 100°
  - e. Apply float sealant 892 BR between strip and keel.
  - f. Secure strip to keel with AN507C832-8 screws, AN960-8 washers, and AN365-832 nuts.



**FIGURE 5.6-5: MAIN KEEL SIMPLE EXTRUSION SPLICE REPAIR**



**FIGURE 5.6-6: 7000 MAIN KEEL REPAIR**



## 5.7 8000 FLOAT EXTRUSION REPAIRS

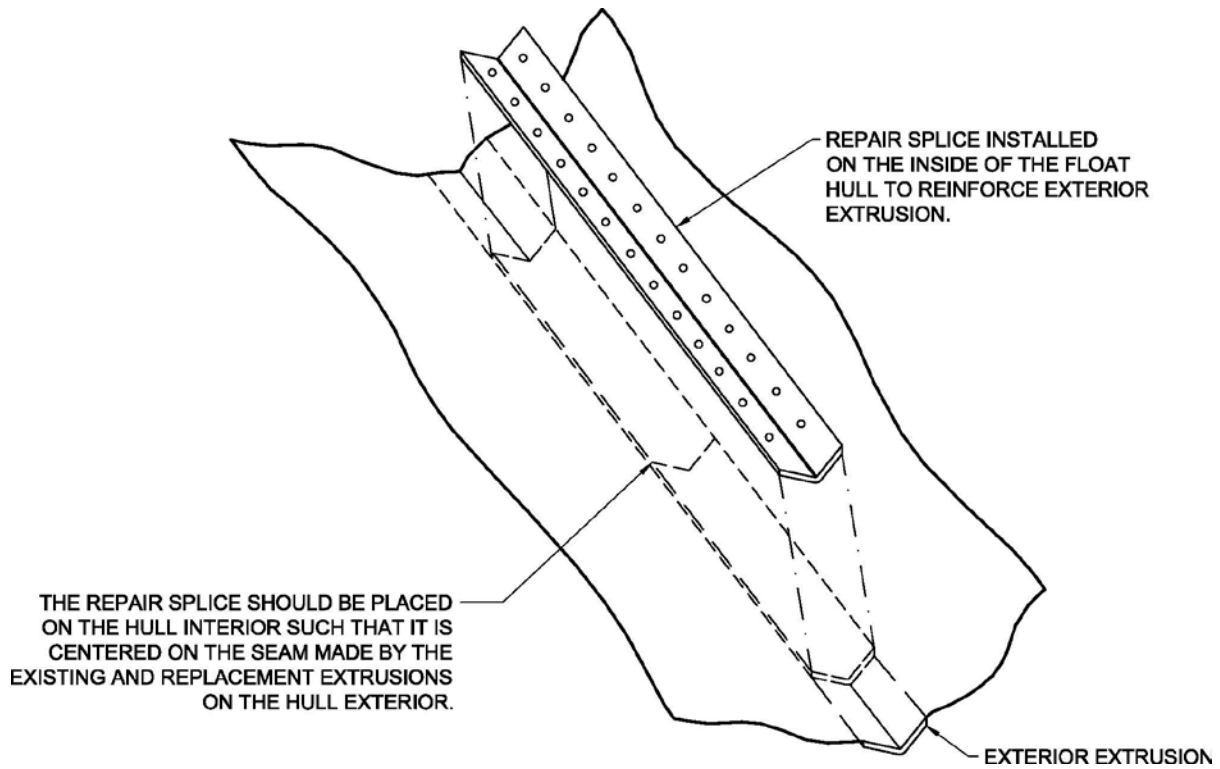
### 5.7.1 SIMPLE EXTRUSION SPLICE REPAIR

The most used and simplest repair is a splice of an extrusion that is a simple one bend angle where the skins attach to each flange. Figure 5.7-1 depicts the general method of this splice repair. The replacement extrusion can be purchased from Wipaire, or in some cases, fabricated per the figures in this section. The internal splices may either be purchased from Wipaire or fabricated per the figures in this section. Consult the Table of Contents at the beginning of this manual to locate applicable figures for your repair.

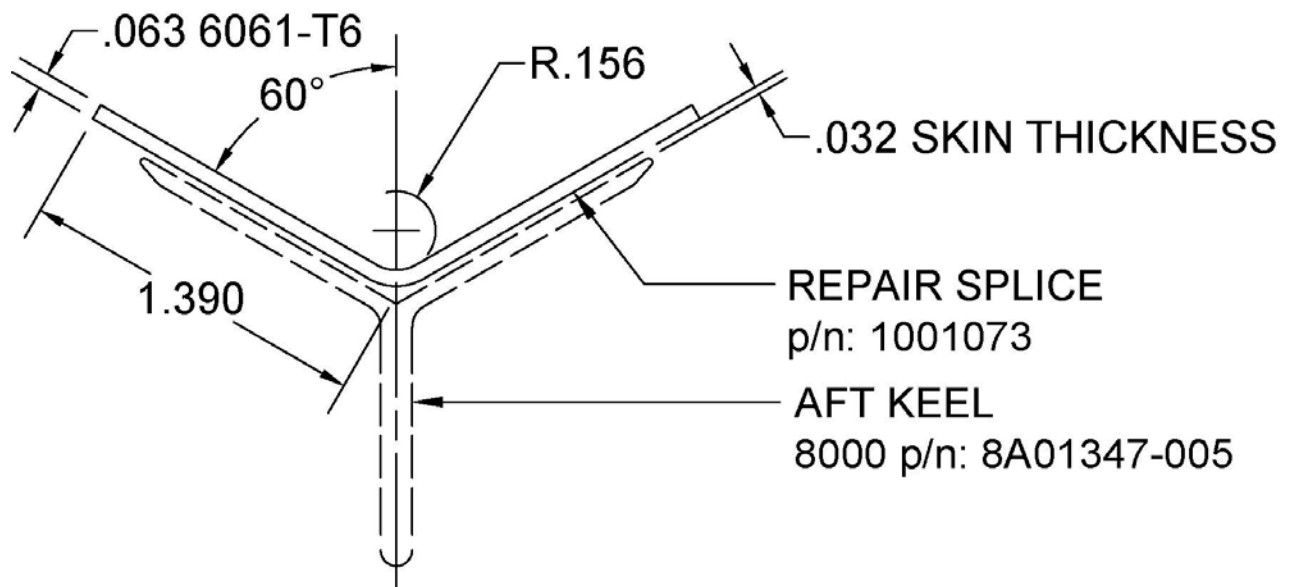
#### Repair Process:

1. Remove rivets (if applicable) about 6-8" on either end of the area to be repaired.
2. Mark damaged area to be removed.
  - a. Be sure to start and end spliced area in the centers of the float bays to prevent interference with the bulkheads or bottom stiffeners.
3. Cut out damaged section being careful NOT to cut into the skins.
4. Obtain new extrusion from Wipaire Parts Department. Cut the repair section from the new extrusion in the exact area of the damage.
5. File to remove rough edges.
6. See Section 3.0 of this manual for appropriate fastener options.
7. Add internal splices, making sure the repair seam is located in the middle of the splice, and that the splice is centered between the bulkheads.

Use existing piece to back drill holes for attachment making sure the distance from the end of the splice to the center of the first hole is greater than or equal to 2 times the diameter of the rivet used.



**FIGURE 5.7-1: SIMPLE EXTRUSION SPLICE REPAIR**



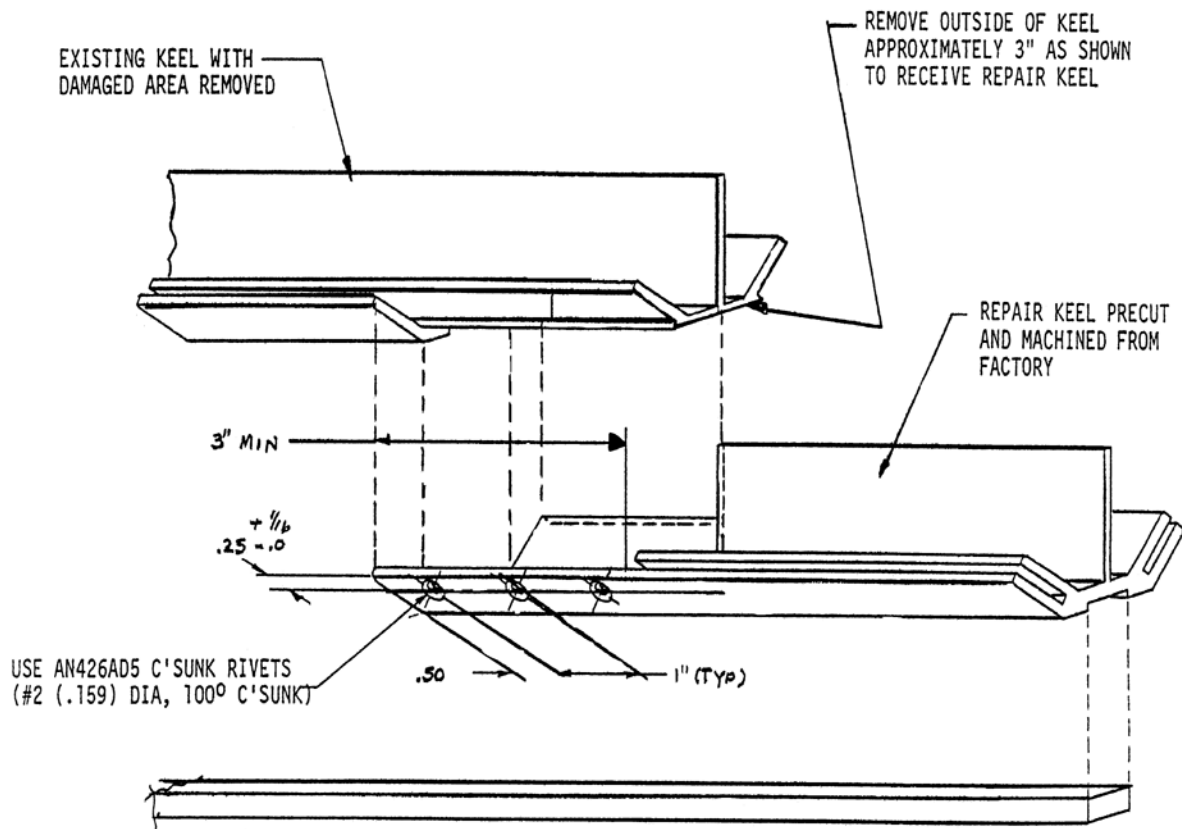
**FIGURE 5.7-2: 8000 AFT KEEL REPAIR**

### 5.7.2 COMPLEX EXTRUSION SPLICE REPAIR

The 3730/3900, 4000, 6000, and 8000 float models utilize complex extrusions with channels on each flange into which the skins are inserted. Figure 5.7-3 depicts the general method of this splice repair. The replacement extrusions and wear strips can be purchased from the Wipaire Parts Department. Consult Table 5.7-1 below to locate applicable part numbers for your repair.

#### Repair Process:

1. Remove the damaged area. On the remaining extrusion, cut out 3" of the outer layer of the extrusion as shown in Figure 5.7-3 so it can receive the repair piece.
2. Purchase the repair part from Wipaire. The repair part will be pre-cut and machined from the factory so only the outside layer of the extrusion remains for 3" at the end and the repair piece will notch together with the existing keel.
3. Fasten the 2 pieces together in the overlapping area using AN426AD5 c'sunk rivets spaced per Figure 5.7-3.
4. If repairing the Main Keel, finish repair by installing a new Wear Strip which can be purchased from Wipaire.
  - a. Position wear strip over main keel
  - b. Drill #29 dia. hole close to each end and between each bulkhead (use old wear strip for approx. locations).
  - c. Tap main keel to 8-32 thru
  - d. Drill wear strip to #17 dia hole and c'sink 100°
  - e. Apply float sealant 892 BR between strip and keel.
  - f. Secure strip to keel with AN507C832-8 screws, AN960-8 washers, and AN365-832 nuts.



**FIGURE 5.7-3: COMPLEX EXTRUSION SPLICE REPAIR**

<b>Main Keel</b>	8A01354-005
<b>Wear Strip</b>	8A01200-003
<b>Sister Keel (outer)</b>	8A01342-005 (left) 8A01342-006 (right)
<b>Gunwall</b>	8A01366-005 (left) 8A01366-006 (right)
<b>Fwd Chine</b>	8A01351-005 (left) 8A01351-006 (right)
<b>Aft Chine</b>	8A01363-005 (left) 8A01363-006 (right)

**TABLE 5.7-1: 8000 COMPLEX EXTRUSION REPLACEMENT PARTS**

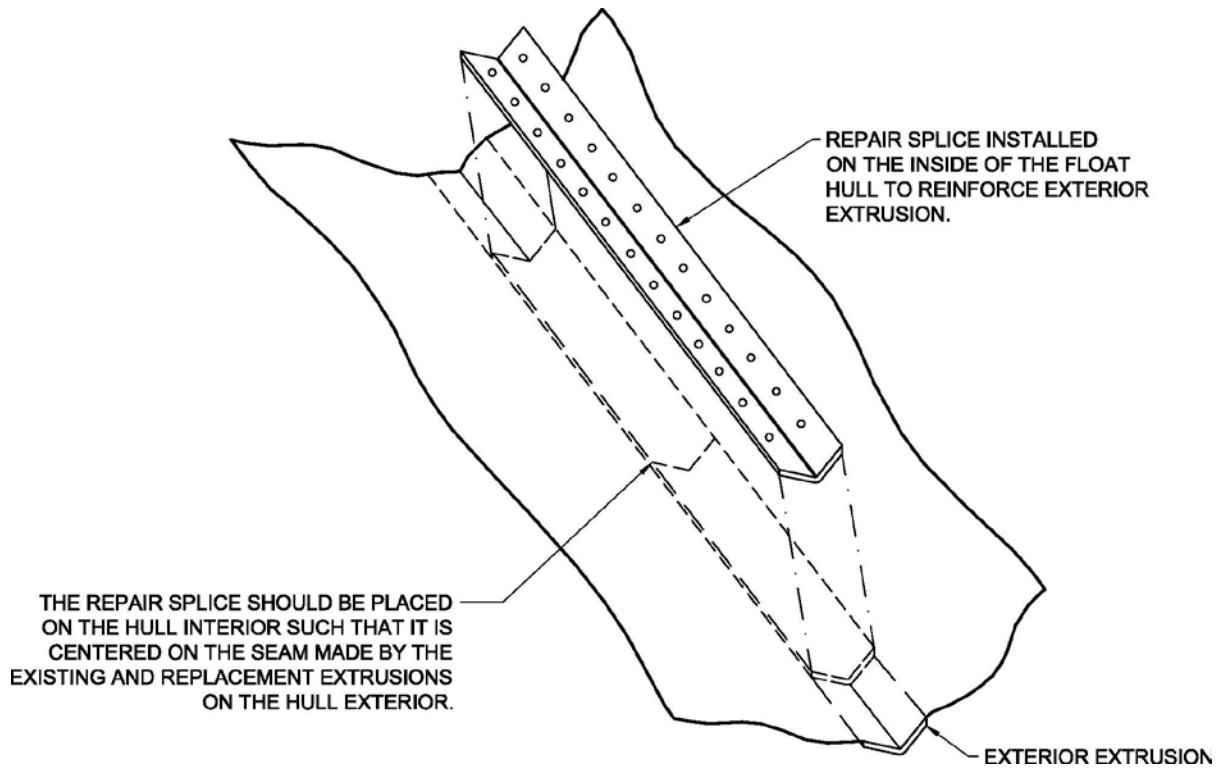
## 5.8 8750 FLOAT EXTRUSION REPAIRS

### 5.8.1 SIMPLE EXTRUSION SPLICE REPAIR

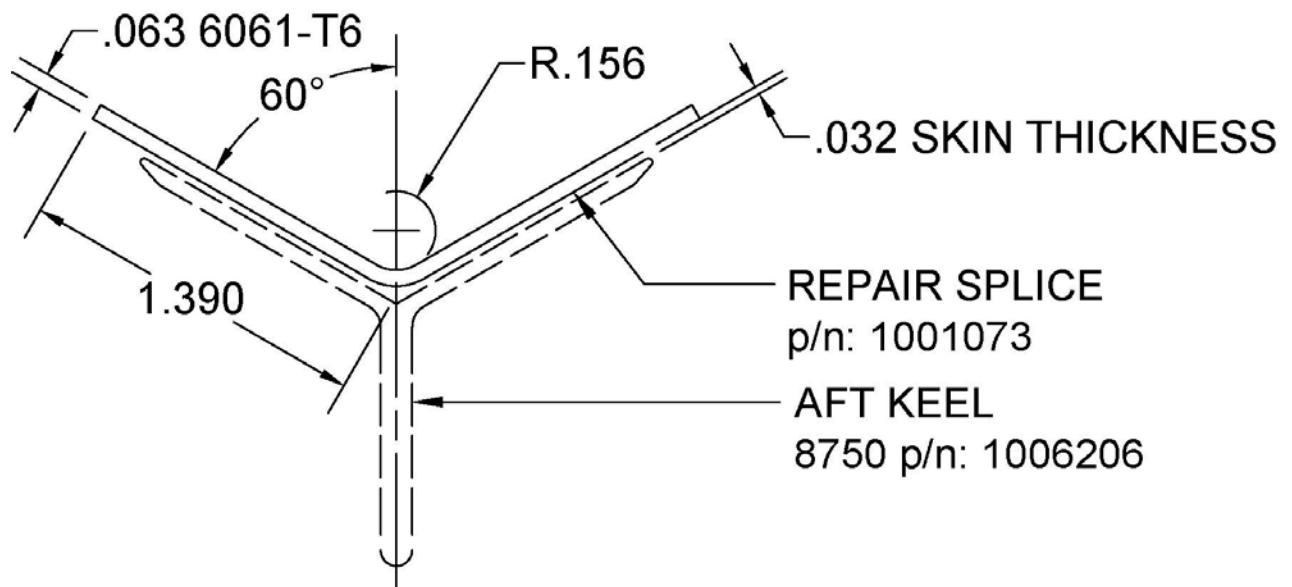
The most used and simplest repair is a splice of an extrusion that is a simple one bend angle where the skins attach to each flange. Figure 5.8-1 depicts the general method of this splice repair. The replacement extrusion can be purchased from Wipaire, or in some cases, fabricated per the figures in this section. The internal splices may either be purchased from Wipaire or fabricated per the figures in this section. Consult the Table of Contents at the beginning of this manual to locate applicable figures for your repair.

#### Repair Process:

1. Remove rivets (if applicable) about 6-8" on either end of the area to be repaired.
2. Mark damaged area to be removed.
  - a. Be sure to start and end spliced area in the centers of the float bays to prevent interference with the bulkheads or bottom stiffeners.
3. Cut out damaged section being careful NOT to cut into the skins.
4. Obtain new extrusion from Wipaire Parts Department. Cut the repair section from the new extrusion in the exact area of the damage.
5. File to remove rough edges.
6. See Section 3.0 of this manual for appropriate fastener options.
7. Add internal splices, making sure the repair seam is located in the middle of the splice, and that the splice is centered between the bulkheads.
8. Use existing piece to back drill holes for attachment making sure the distance from the end of the splice to the center of the first hole is greater than or equal to 2 times the diameter of the rivet used.



**FIGURE 5.8-1: SIMPLE EXTRUSION SPLICE REPAIR**



**FIGURE 5.8-2: 8750 AFT KEEL REPAIR**

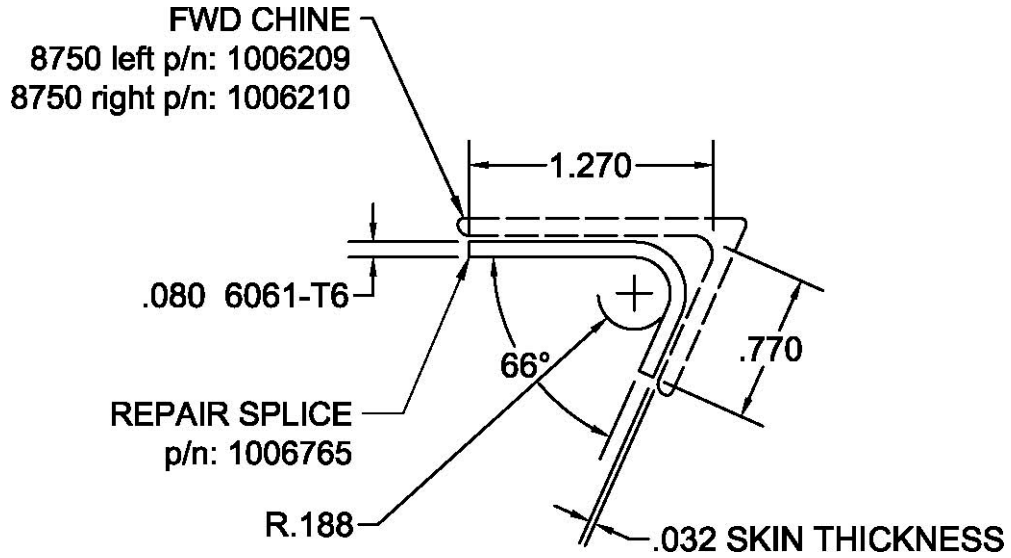


FIGURE 5.8-3: 8750 FWD CHINE REPAIR

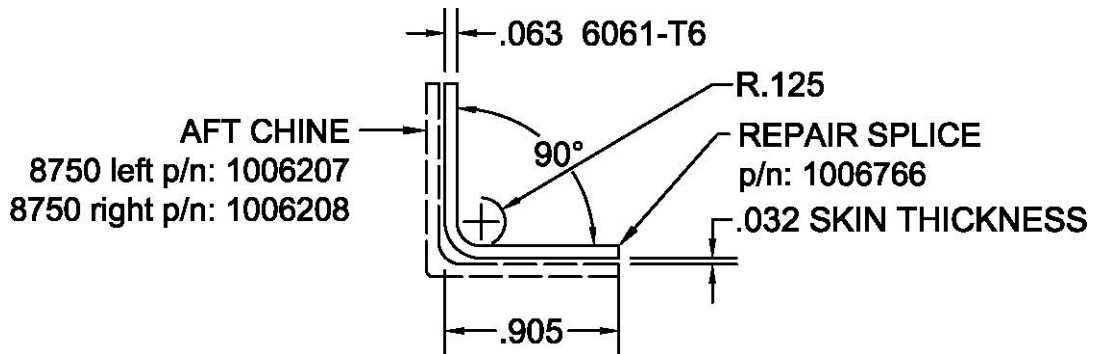


FIGURE 5.8-4: 8750 AFT CHINE REPAIR

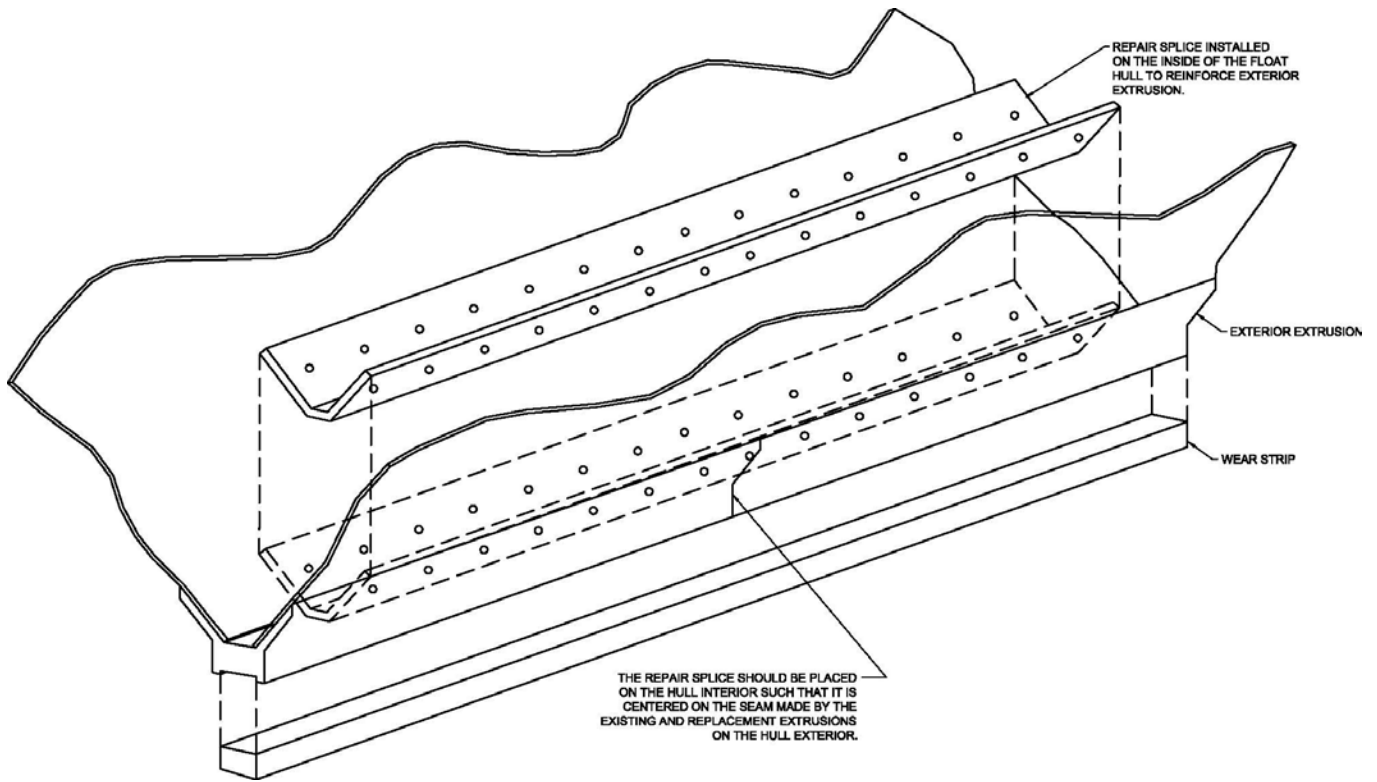
### 5.8.2 MAIN KEEL EXTRUSION SPLICE REPAIR

On several float models, the main keel will have a flat bottom with an attached wear strip that must be replaced when repairs are made. Figure 5.8-5 depicts the general method of this splice repair. The replacement extrusion can be purchased from Wipaire, and the internal splices may either be purchased from Wipaire or fabricated per the figures in this section. Consult the Table of Contents at the beginning of this manual to locate applicable figures for your repair.

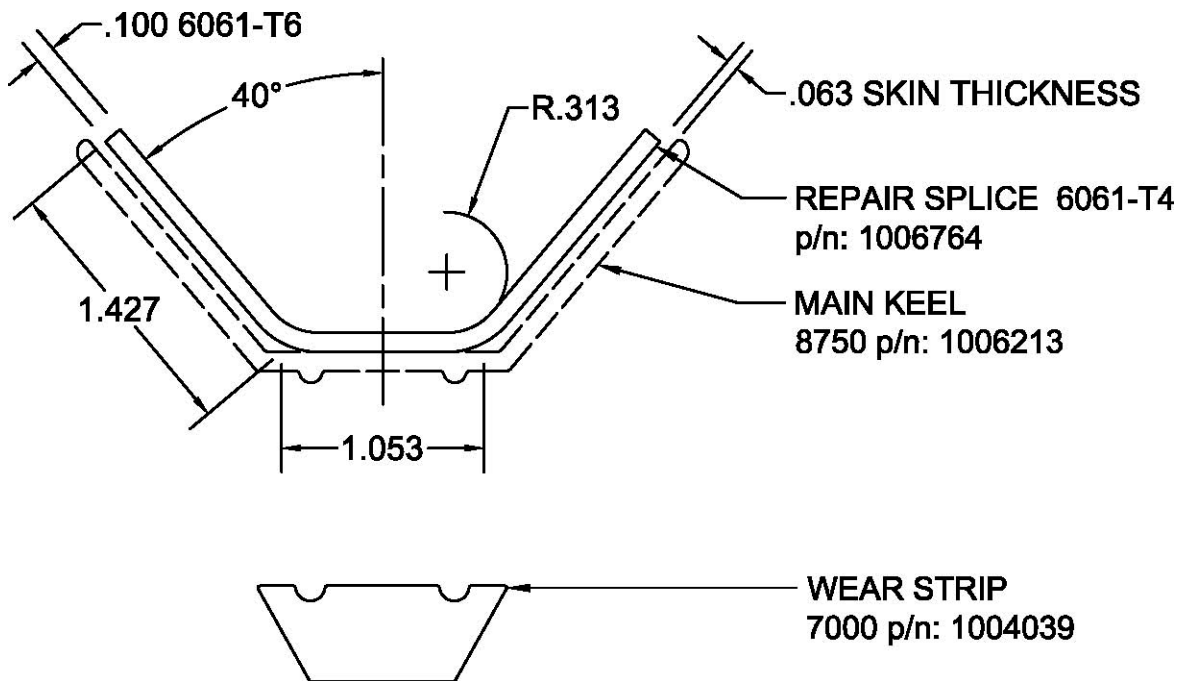
#### Repair Process:

1. Remove entire wear strip. Purchase new Wear Strip from Wipaire (1004039).
2. Remove rivets (if applicable) about 6-8" on either end of the area to be repaired.
3. Mark damaged area to be removed.
  - a. Be sure to start and end spliced area in the centers of the float bays to prevent interference with the bulkheads or bottom stiffeners.
4. Cut out damaged section being careful NOT to cut into the skins.
5. Obtain new extrusion from Wipaire Parts Department (1006213) and cut out the repair section from the new extrusion in the exact area of the damage.
6. File to remove rough edges.
7. See Section 3.0 of this manual for appropriate fastener options.
8. Add internal splices making sure the repair seam is located in the middle of the splice.
9. Install the new wear strip.
  - a. Position wear strip over main keel
  - b. Drill #29 dia. hole close to each end and between each bulkhead (use old wear strip for approximate locations).
  - c. Tap main keel to 8-32 thru
  - d. Drill wear strip to #17 dia. hole and c'sink 100°
  - e. Apply float sealant 892 BR between strip and keel.  
Secure strip to keel with AN507C832-8 screws, AN960-8 washers, and AN365-832 nuts.





**FIGURE 5.8-5: MAIN KEEL SIMPLE EXTRUSION SPLICE REPAIR**



**FIGURE 5.8-6: 8750 MAIN KEEL REPAIR**

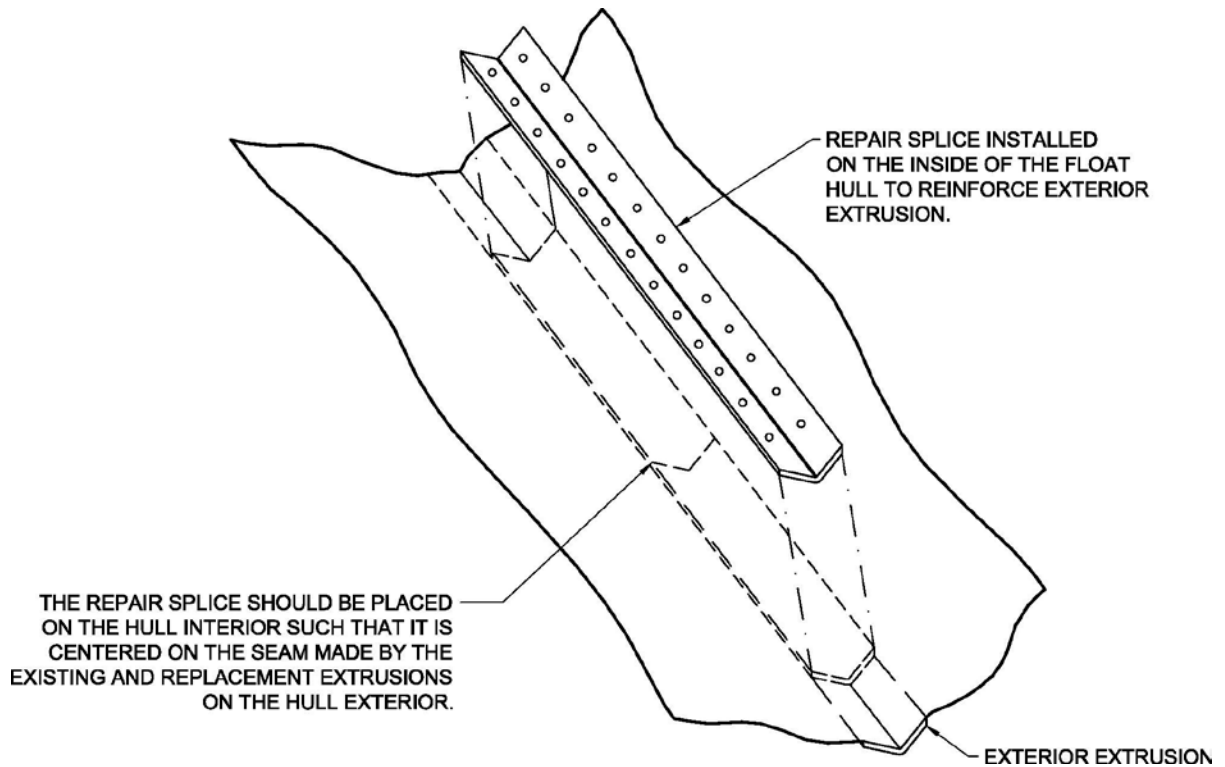
## 5.9 10000 FLOAT EXTRUSION REPAIRS

### 5.9.1 SIMPLE EXTRUSION SPLICE REPAIR

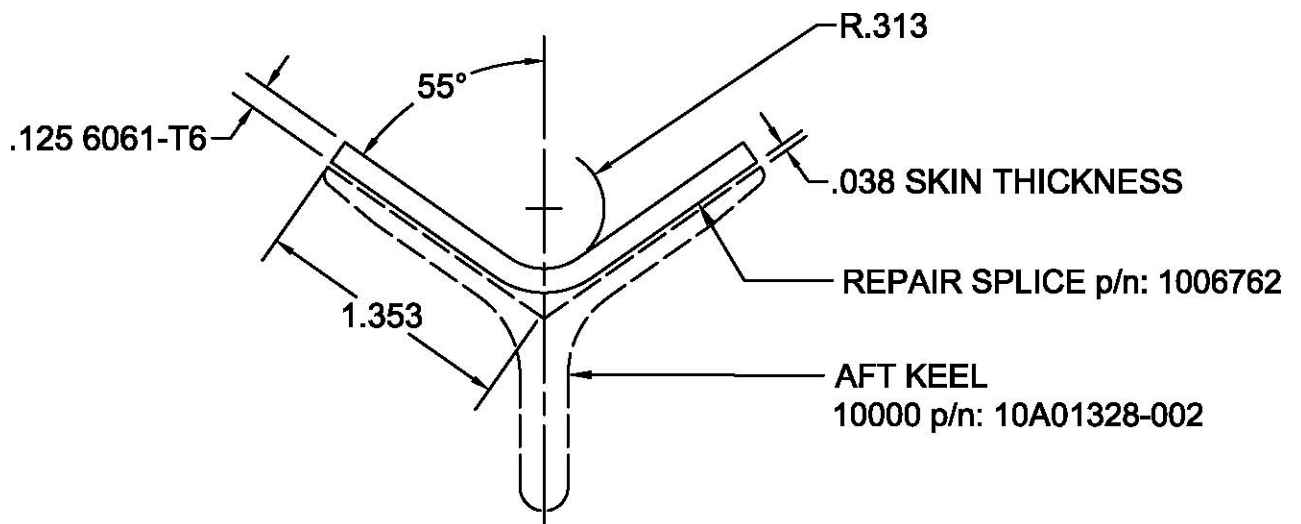
The most used and simplest repair is a splice of an extrusion that is a simple one bend angle where the skins attach to each flange. Figure 5.9-1 depicts the general method of this splice repair. The replacement extrusion can be purchased from Wipaire, or in some cases, fabricated per the figures in this section. The internal splices may either be purchased from Wipaire or fabricated per the figures in this section. Consult the Table of Contents at the beginning of this manual to locate applicable figures for your repair.

#### Repair Process:

1. Remove rivets (if applicable) about 6-8" on either end of the area to be repaired.
2. Mark damaged area to be removed.
  - a. Be sure to start and end spliced area in the centers of the float bays to prevent interference with the bulkheads or bottom stiffeners.
3. Cut out damaged section being careful NOT to cut into the skins.
4. Obtain new extrusion from Wipaire Parts Department. Cut the repair section from the new extrusion in the exact area of the damage.
5. File to remove rough edges.
6. See Section 3.0 of this manual for appropriate fastener options.
7. Add internal splices, making sure the repair seam is located in the middle of the splice, and that the splice is centered between the bulkheads.
8. Use existing piece to back drill holes for attachment making sure the distance from the end of the splice to the center of the first hole is greater than or equal to 2 times the diameter of the rivet used.



**FIGURE 5.9-1: SIMPLE EXTRUSION SPLICE REPAIR**



**FIGURE 5.9-2: 10000 AFT KEEL REPAIR**

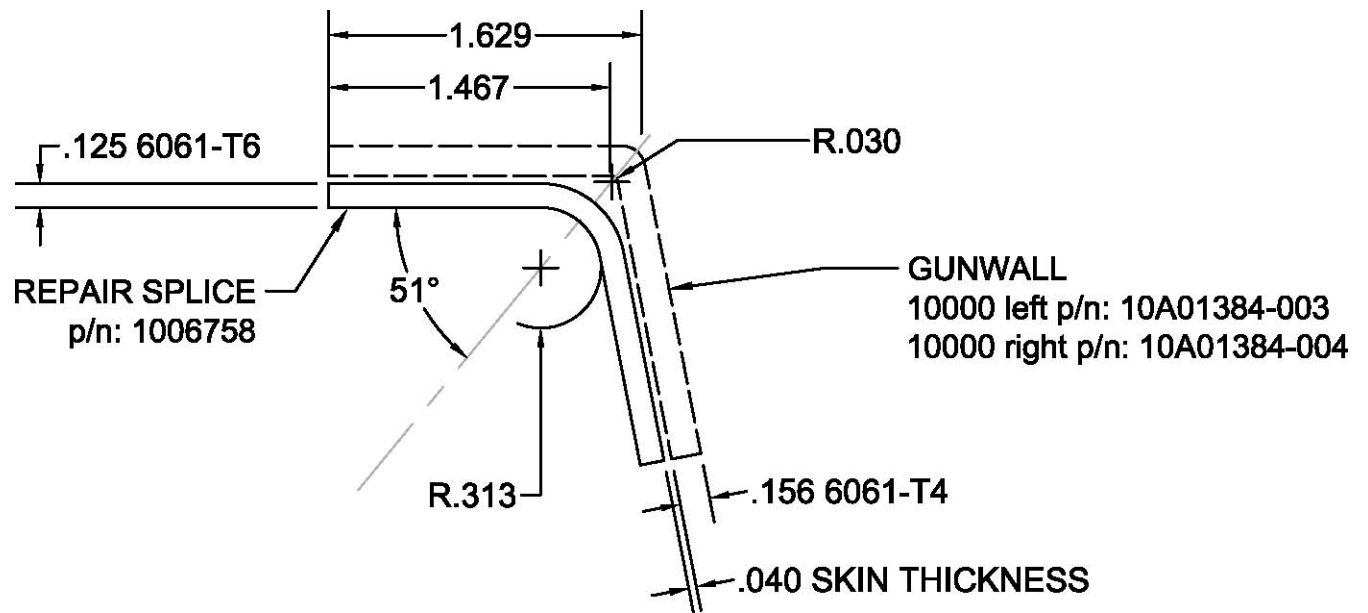


FIGURE 5.9-3: 10000 GUNWALL REPAIR

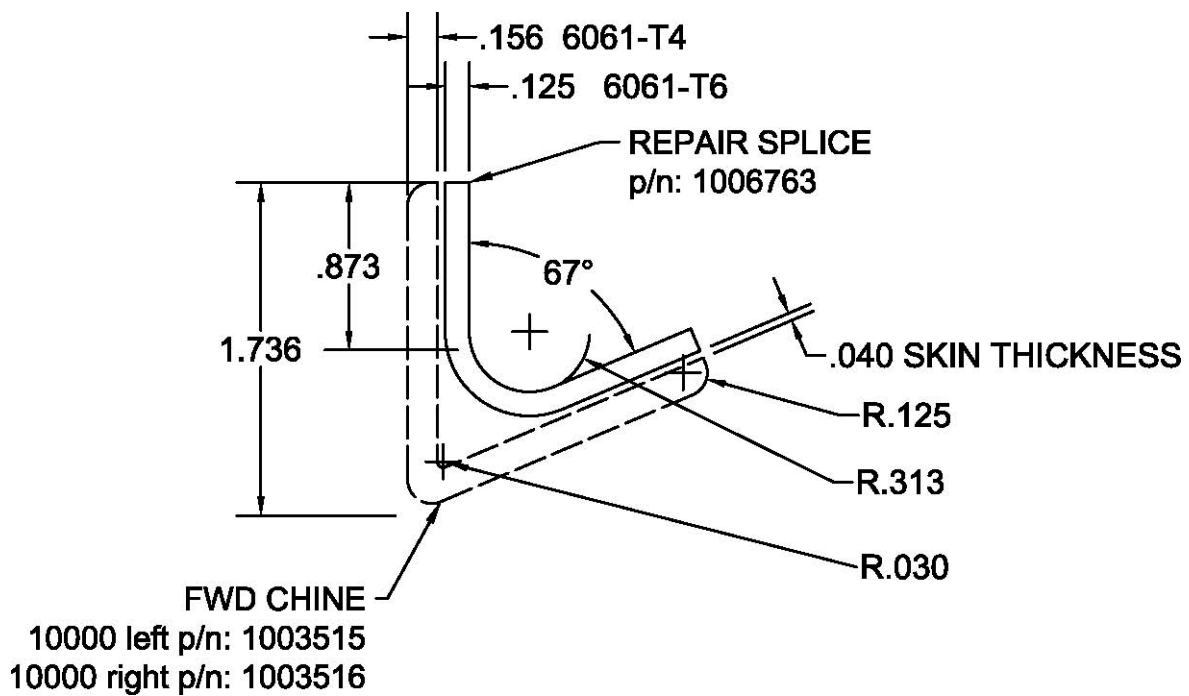
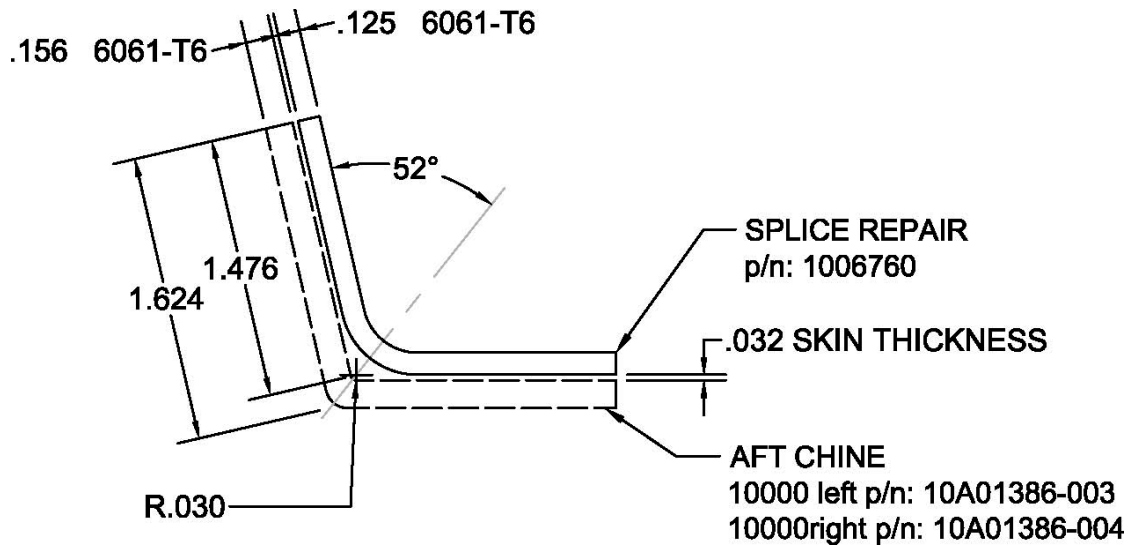


FIGURE 5.9-4: 10000 FWD CHINE REPAIR



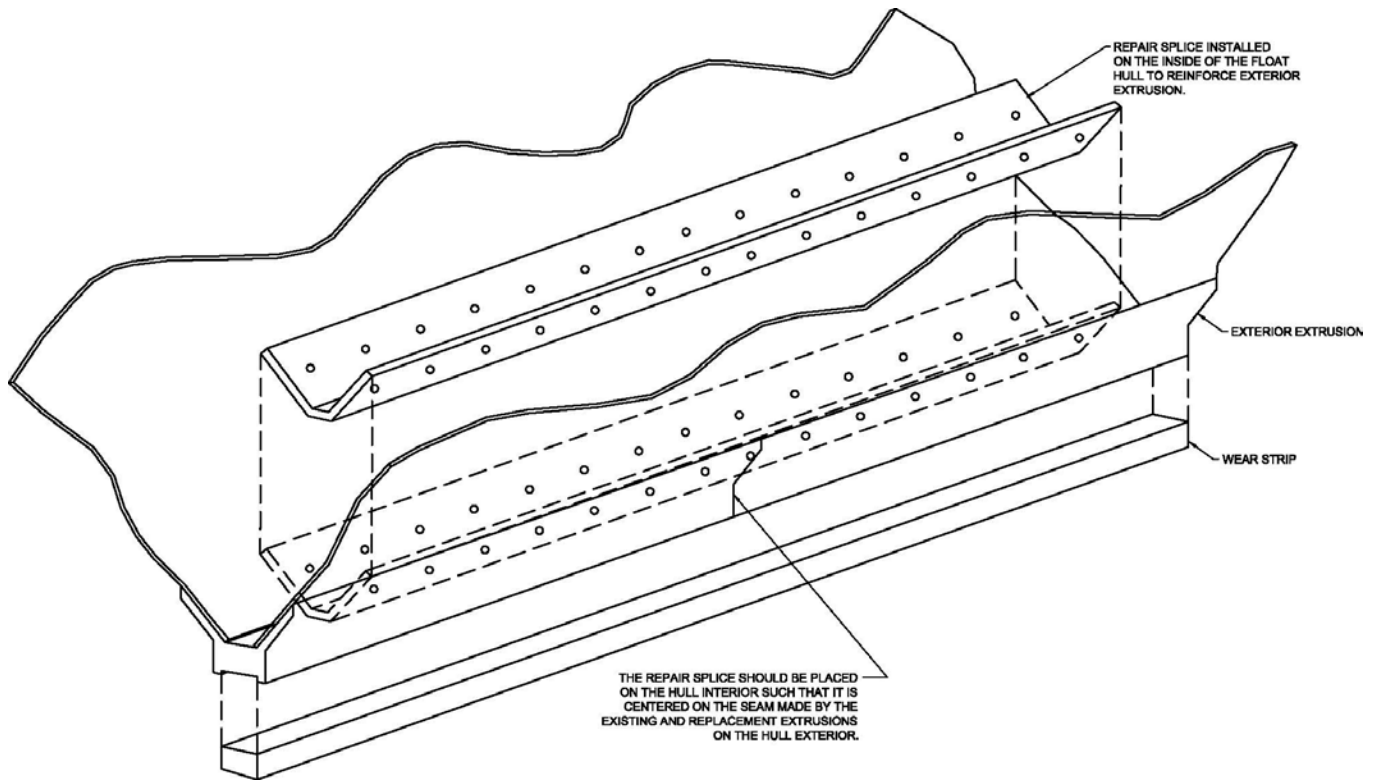
**FIGURE 5.9-5: 10000 AFT CHINE REPAIR**

### 5.9.2 MAIN KEEL EXTRUSION SPLICE REPAIR

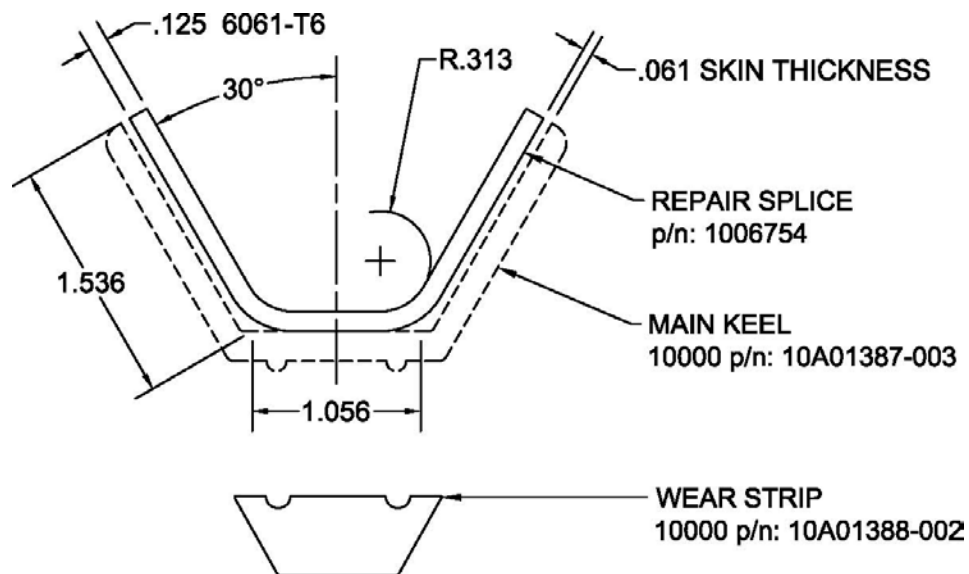
On several float models, the main keel will have a flat bottom with an attached wear strip that must be replaced when repairs are made. Figure 5.9-6 depicts the general method of this splice repair. The replacement extrusion can be purchased from Wipaire, and the internal splices may either be purchased from Wipaire or fabricated per the figures in this section. Consult the Table of Contents at the beginning of this manual to locate applicable figures for your repair.

#### Repair Process:

1. Remove entire wear strip. Purchase new Wear Strip from Wipaire (10A01388-002).
2. Remove rivets (if applicable) about 6-8" on either end of the area to be repaired.
3. Mark damaged area to be removed.
  - a. Be sure to start and end spliced area in the centers of the float bays to prevent interference with the bulkheads or bottom stiffeners.
4. Cut out damaged section being careful NOT to cut into the skins.
5. Obtain new extrusion from Wipaire Parts Department (10A01387-003), and cut out the repair section from the new extrusion in the exact area of the damage.
6. File to remove rough edges.
7. See Section 3.0 of this manual for appropriate fastener options.
8. Add internal splices making sure the repair seam is located in the middle of the splice.
9. Install the new wear strip.
  - a. Position wear strip over main keel
  - b. Drill #29 dia. hole close to each end and between each bulkhead (use old wear strip for approximate locations).
  - c. Tap main keel to 8-32 thru
  - d. Drill wear strip to #17 dia. hole and c'sink 100°
  - e. Apply float sealant 892 BR between strip and keel.
  - f. Secure strip to keel with AN507C832-8 screws, AN960-8 washers, and AN365-832 nuts.



**FIGURE 5.9-6: MAIN KEEL SIMPLE EXTRUSION SPLICE REPAIR**

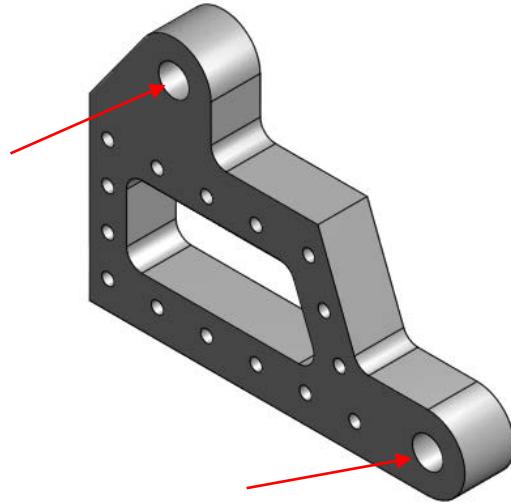


**FIGURE 5.9-7: 10000 MAIN KEEL REPAIR**

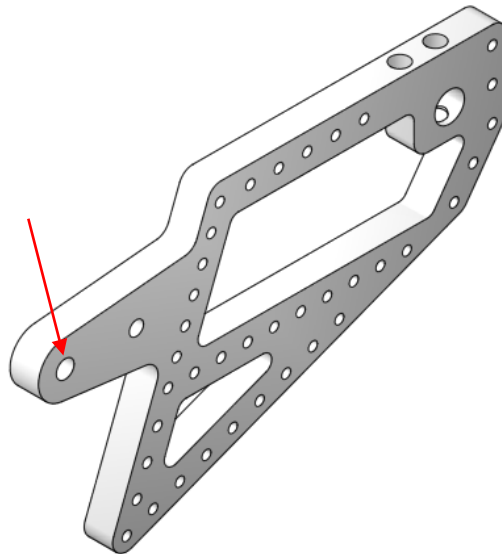
### 5.9.3 MAIN AND FRONT STRUT FITTING REPAIR

This repair scheme is to be used to repair the  $\emptyset.625$ " bolt holes on the main and front strut fittings when they have become larger than nominal. The fix should be considered optional for holes  $\emptyset.628$ " -  $\emptyset.645$ " and mandatory for holes over  $\emptyset.645$ ".

1. Drill out the out of spec hole with a 47/64 drill bit.
2. Make or purchase bushing per print in figure 5.9-10. Measure the outside diameter of the bushing.
3. Ream the hole with an adjustable hand reamer until the hole is .75 or .001 smaller than the bushing. It will be hard to press the bushing into the hole if the difference between the hole and the bushing is greater than .001. The bushing and hole should have an interference of .001.
4. Use a hand deburring tool to remove the sharp edges on the hole. Clean out the hole after reaming.
5. The float fitting will need to be degreased and alodine conversion coated as soon as possible after the machining operations.
6. Assembly of the bushing into the fitting will be done "wet" with a thin coat of polysulfide sealant or equivalent.
7. The bushing is designed with a chamfer to help start it into the hole. Make sure the bushing is pressed in chamfer first.
8. The bushing will be pressed flush with the surface of the fitting, a clamp or press should be used to squarely press the bushing into the hole.
9. After pressing the bushing in, the bushing may need to be reamed out to a diameter of .625".
10. The bushing should be flush or recessed so that it does not interfere with the strut upon assembly.
11. After installing the bushing, prime the area and apply a corrosion inhibiting compound prior to strut installation.



**FIGURE 5.9-8: 10000 STRUT REPAIR FITTING 13A01085-001**



**FIGURE 5.9-9: 10000 STRUT REPAIR FITTING 13A01161-002**



STRUCTURAL REPAIR MANUAL FOR WIPLINE ALUMINUM FLOATS

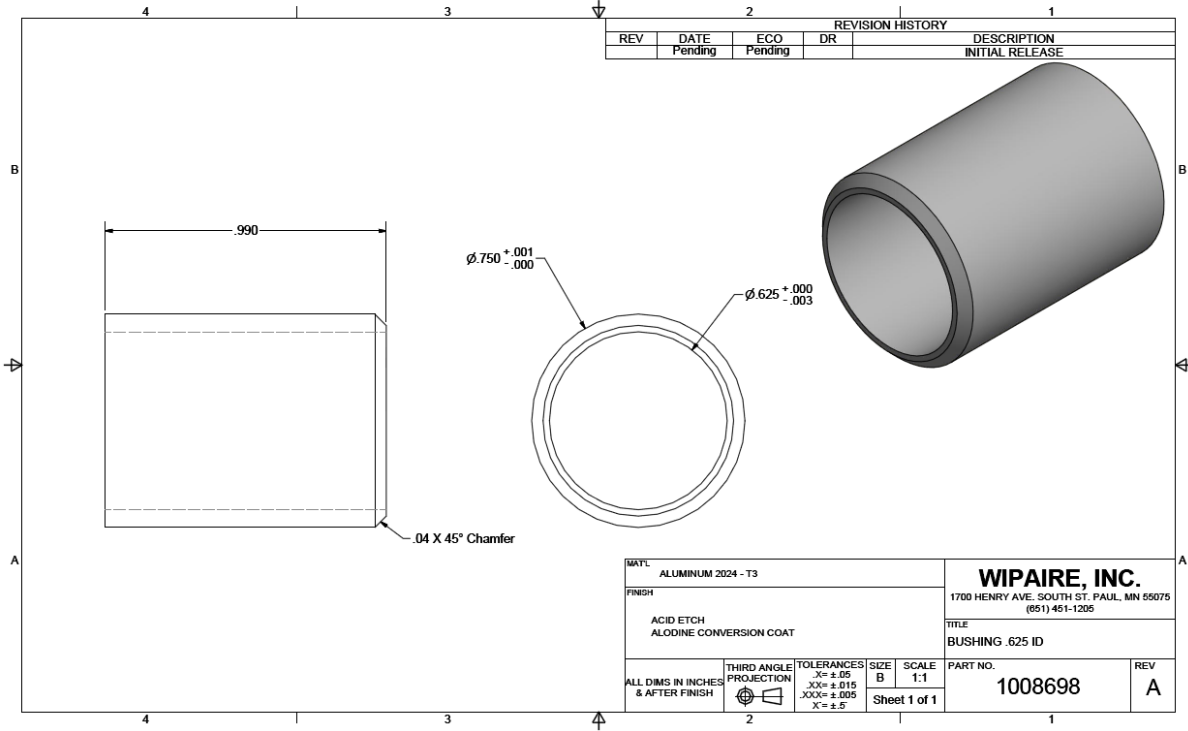


FIGURE 5.9-10: 10000 STRUT REPAIR

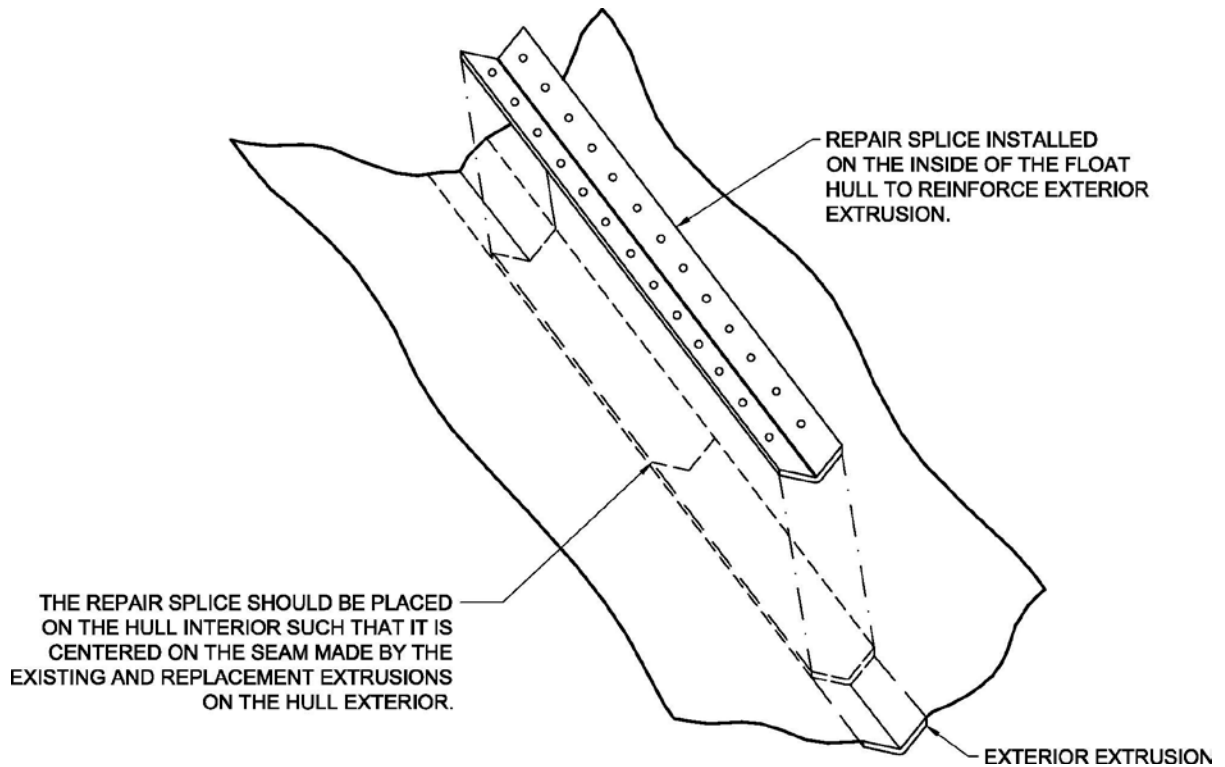
## 5.10 13000 FLOAT EXTRUSION REPAIRS

### 5.10.1 SIMPLE EXTRUSION SPLICE REPAIR

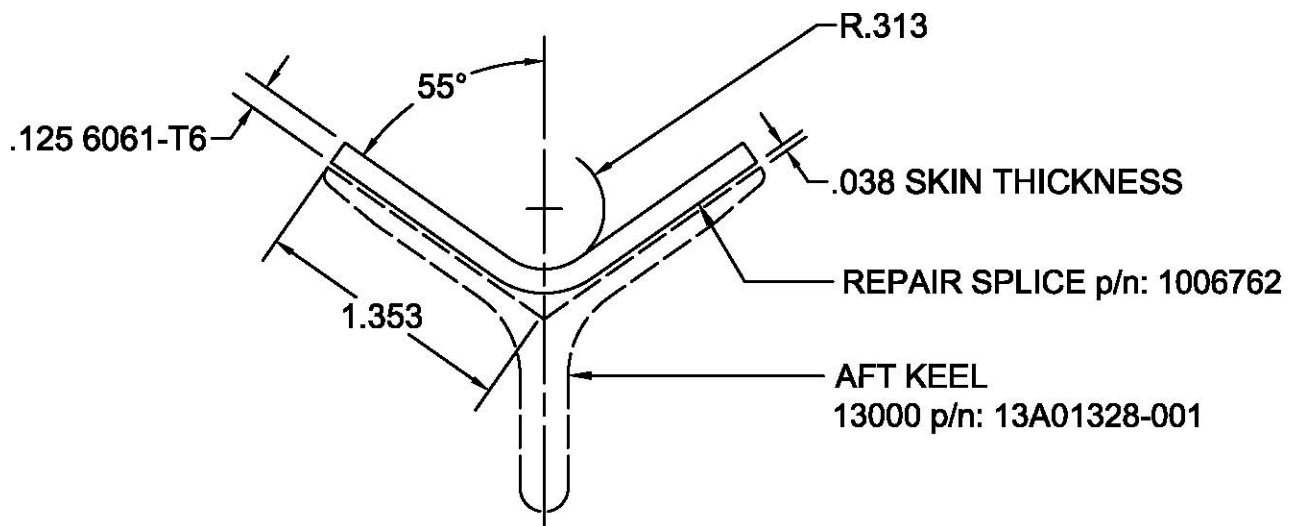
The most used and simplest repair is a splice of an extrusion that is a simple one bend angle where the skins attach to each flange. Figure 5.10-1 depicts the general method of this splice repair. The replacement extrusion can be purchased from Wipaire, or in some cases, fabricated per the figures in this section. The internal splices may either be purchased from Wipaire or fabricated per the figures in this section. Consult the Table of Contents at the beginning of this manual to locate applicable figures for your repair.

#### Repair Process:

1. Remove rivets (if applicable) about 6-8" on either end of the area to be repaired.
2. Mark damaged area to be removed.
  - a. Be sure to start and end spliced area in the centers of the float bays to prevent interference with the bulkheads or bottom stiffeners.
3. Cut out damaged section being careful NOT to cut into the skins.
4. Obtain new extrusion from Wipaire Parts Department. Cut the repair section from the new extrusion in the exact area of the damage.
5. File to remove rough edges.
6. See Section 3.0 of this manual for appropriate fastener options.
7. Add internal splices, making sure the repair seam is located in the middle of the splice, and that the splice is centered between the bulkheads.
8. Use existing piece to back drill holes for attachment making sure the distance from the end of the splice to the center of the first hole is greater than or equal to 2 times the diameter of the rivet used.



**FIGURE 5.10-1: SIMPLE EXTRUSION SPLICE REPAIR**



**FIGURE 5.10-2: 13000 AFT KEEL REPAIR**

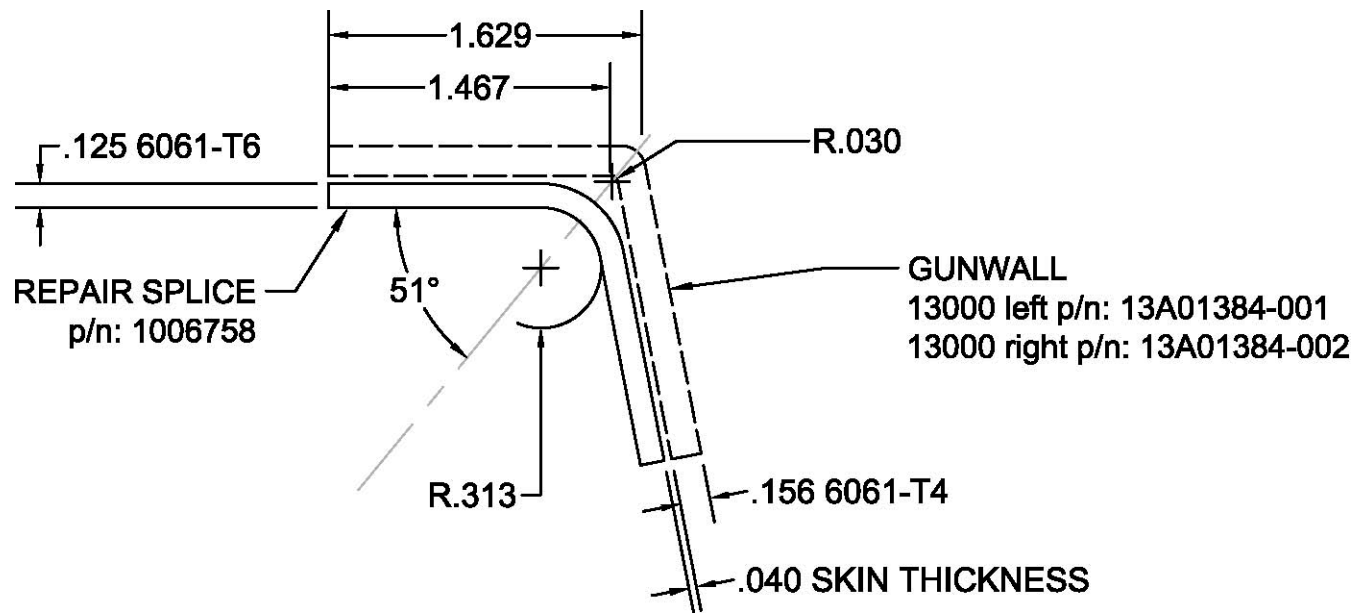


FIGURE 5.10-3: 13000 GUNWALL REPAIR

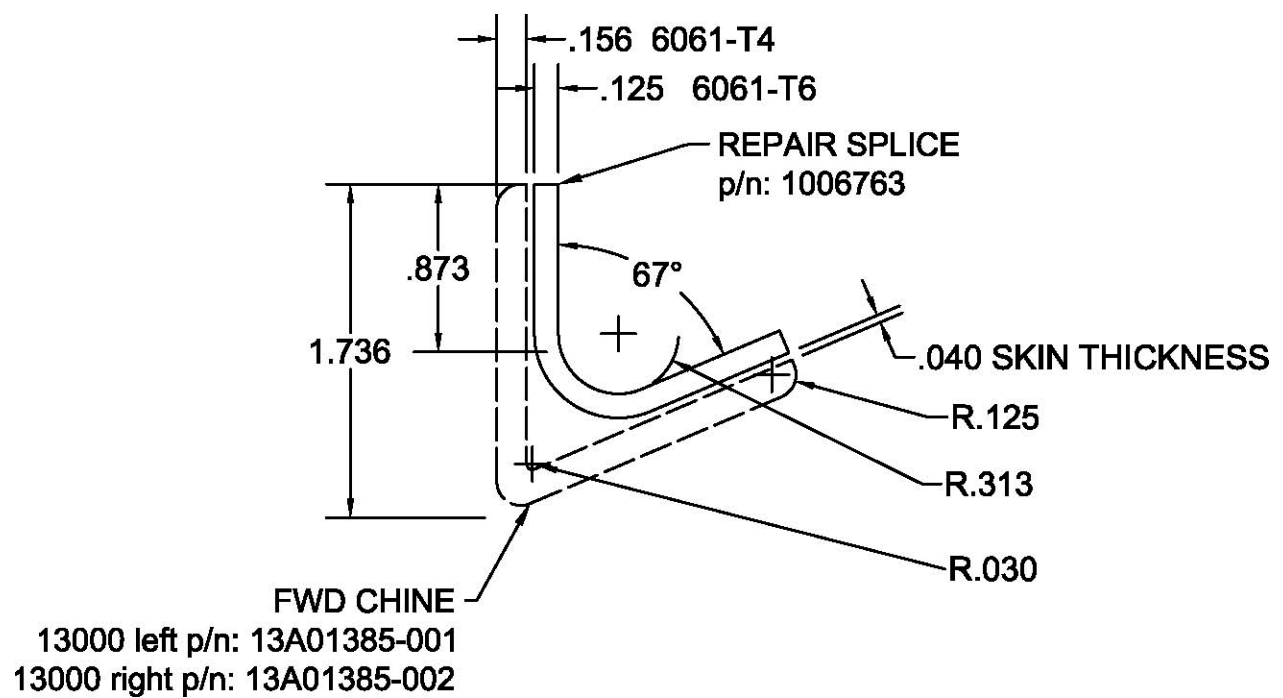
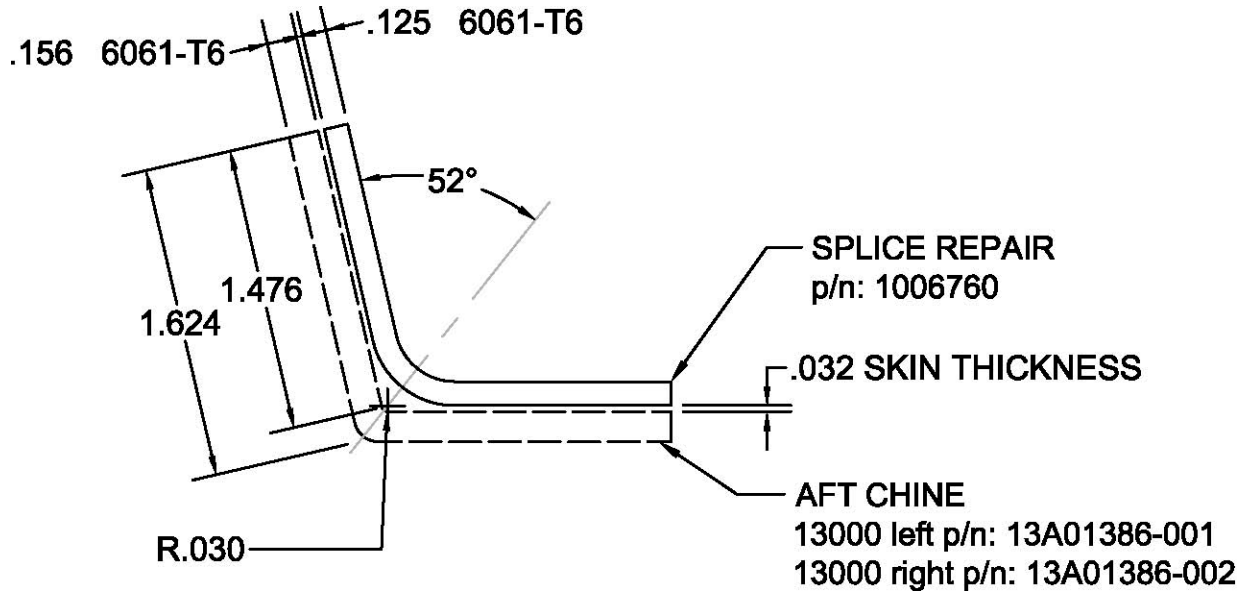


FIGURE 5.10-4: 13000 FWD CHINE REPAIR



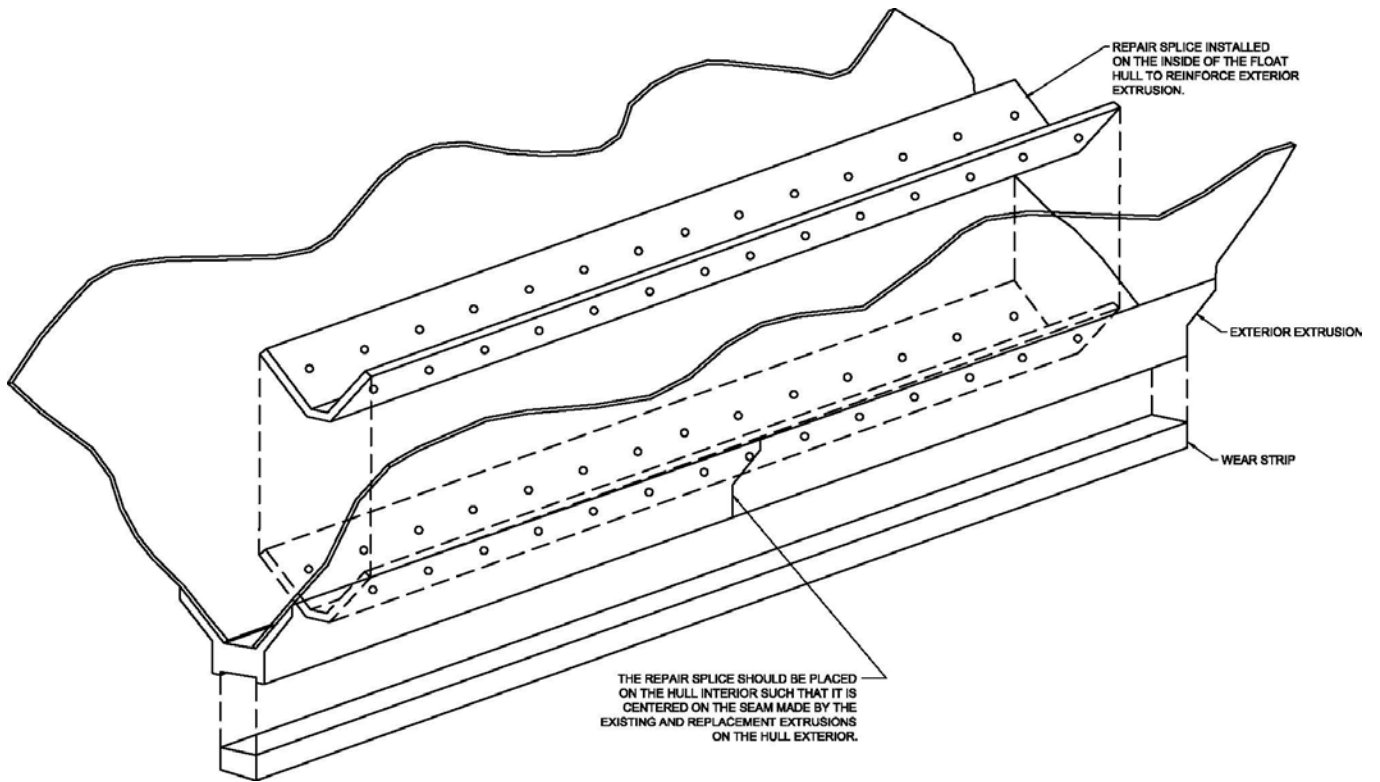
**FIGURE 5.10-5: 13000 AFT CHINE REPAIR**

### 5.10.2 MAIN KEEL EXTRUSION SPLICE REPAIR

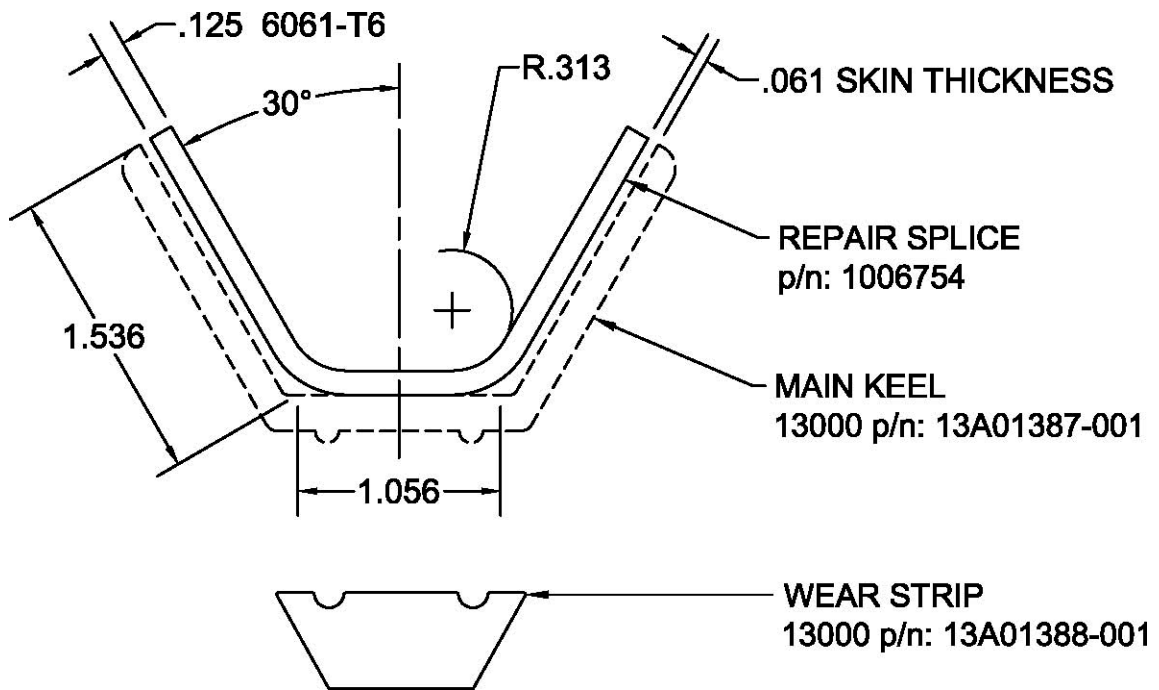
On several float models, the main keel will have a flat bottom with an attached wear strip that must be replaced when repairs are made. Figure 5.10-6 depicts the general method of this splice repair. The replacement extrusion can be purchased from Wipaire, and the internal splices may either be purchased from Wipaire or fabricated per the figures in this section. Consult the Table of Contents at the beginning of this manual to locate applicable figures for your repair.

#### Repair Process:

1. Remove entire wear strip. Purchase new Wear Strip from Wipaire (13A01388-001).
2. Remove rivets (if applicable) about 6-8" on either end of the area to be repaired.
3. Mark damaged area to be removed.
  - a. Be sure to start and end spliced area in the centers of the float bays to prevent interference with the bulkheads or bottom stiffeners.
4. Cut out damaged section being careful NOT to cut into the skins.
5. Obtain new extrusion from Wipaire Parts Department (13A01387-001), and cut out the repair section from the new extrusion in the exact area of the damage.
6. File to remove rough edges.
7. See Section 3.0 of this manual for appropriate fastener options.
8. Add internal splices making sure the repair seam is located in the middle of the splice.
9. Install the new wear strip.
  - a. Position wear strip over main keel
  - b. Drill #29 dia. hole close to each end and between each bulkhead (use old wear strip for approximate locations).
  - c. Tap main keel to 8-32 thru
  - d. Drill wear strip to #17 dia. hole and c'sink 100°
  - e. Apply float sealant 892 BR between strip and keel.
  - f. Secure strip to keel with AN507C832-8 screws, AN960-8 washers, and AN365-832 nuts.



**FIGURE 5.10-6: MAIN KEEL SIMPLE EXTRUSION SPLICE REPAIR**



**FIGURE 5.10-7: 13000 MAIN KEEL REPAIR**

## **6.0 FLOAT HULL BULKHEADS**

Float hull bulkheads are the vertical structures that internally divide the floats into bays. Bulkheads add strength to the float structure and keep water contained to one bay in the event of a leak. Bulkheads are constructed either of 6061-T6 or 2024-T3 aluminum and are riveted in place. They vary in size and thickness depending on the float model and location within the float. Damage to any float bulkheads may be repaired in accordance with this section, Section 6.0 of this manual, or any acceptable repair method listed in FAA Advisory Circular 43.13-1B. Any float parts, including bulkheads, can be purchased from Wipaire. To simplify repairs, the sheet metal can be ordered pre-cut and pre-drilled. Contact Wipaire Customer Service to order parts.

During extensive maintenance of 10000 and 13000 series floats, it may be desirable to cut an access hole in a solid bulkhead to enable replacement of neighboring float structure. This type of access hole can be cut and then repaired according to Figure 4-2 in Section 4 of this manual. This is only acceptable practice on the 10000 and 13000 series floats.

Repair of bulkheads of Wipline floats can be categorized into a few general methods based on the type of damage and bulkhead configuration.

### Complete Bulkhead Replacement

This method is used when the bulkhead has sustained extensive damage and other repair methods within this manual are not feasible.

### Partial Bulkhead Replacement

Partial bulkhead replacement is used when a bulkhead has sustained damage in a local area. Typically, a section of bulkhead is removed when cutting out the damaged area, requiring a new section of bulkhead.

### Bulkhead Reinforcement

Bulkhead reinforcement is used when a crack is discovered that can be stop drilled and reinforced to prevent further cracking.



## **6.1 COMPLETE BULKHEAD REPLACEMENT**

To replace a complete bulkhead, you must gain access to the bulkhead. This may include removing one side skin if no other access is available.

Gain access to the bulkhead by removing a side skin or opening a baggage compartment door. Drill out all rivets and remove any fasteners attaching the bulkhead to the float structure. Carefully examine the area for any additional hidden damage. Install the new bulkhead using the same fasteners as original wherever possible.

## **6.2 PARTIAL BULKHEAD REPLACEMENT**

Partial bulkhead replacements will vary depending on the scope of the repair. A properly repaired bulkhead will be as strong as the original.

Remove damaged area of bulkhead.

Cut partial bulkhead for installation large enough to allow for proper rivet edge distance.

## **6.3 BULKHEAD REINFORCEMENT**

Carefully examine the cracked area for additional damage. Stop drill cracks to prevent further cracking. Determine the size of the reinforcement required based on the damaged area. The doubler should at least completely overlap the cracked area. Rivet spacing should match existing rivet spacing or be less.

## **6.4 BULKHEAD REPAIR**

Carefully inspect the area that is requiring repair. Determine the original thickness and type of material being repaired. Determine the amount of original material that needs to be removed prior to repair. Use AC43.13-1B or later FAA approved revision for guidelines to determine the required size of the doubler. Rivet spacing should match existing rivet spacing or be less.

## **6.5 BULKHEAD BUCKLING AND CRACKING**

### **6.5.1 BULKHEAD BUCKLING**

Bulkhead buckling. Small bulkhead buckles are not a structural concern. These buckles occur due to local water impacts. When a bulkhead buckles, it actually makes the structure more able to take local water impact loads due to an increase in the local flexibility. This increased flexibility allows the structure to flex and absorb the water impact without damage to other float structure. For this reason it is not a structural requirement to fix small bulkhead and flange buckles to maintain the structural integrity of the float.

### **6.5.2 BULKHEAD CRACKING**

Cracking. The downside to bulkhead buckles is that they will eventually turn into cracks. Once a crack has started in a bulkhead it isn't going to stop. For this reason any bulkhead buckles that have developed cracks should be addressed when discovered. Standard repair methodology for cracks should be employed. In the case of many Wipline floats it may be acceptable to cut off the bulkhead flange and rivet a new flange to the bulkhead. In other, more severe, cases it may be necessary to replace an entire bulkhead. This must be evaluated for each case as it is discovered. When repairing any cracks the integrity of the sealed compartment must be met after the repair is conducted.