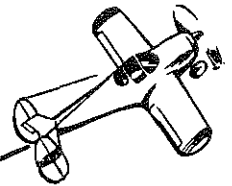


**ERCOUPE  
SERVICE  
MEMORANDUM**

**No. 39**

# *Ercoupe* **MEMORANDUM**

**SUBJECT: Installation of Aluminum Wing  
Tanks in lieu of Ternplate Tanks**



**(Effective serial numbers 813 to 2622, incl.)**

1. The Service Department has received requests for information on the possibilities of replacing wing fuel tanks constructed of ternplate with the aluminum tanks. As is our policy, we are forwarding the necessary information required to make this change. The installation procedure, for use of the aluminum wing tank replacement kit which is now available for this change, is contained in this memorandum.

2. To prepare the Ercoupe for the installation of the aluminum tanks, certain modifications are required. To accomplish these modifications and make the installation in the shortest amount of time, the following procedure is recommended.

**1. Draining of Fuel:**

- a. Drain fuel from both wing tanks. It is not necessary to drain the fuselage tank.

**2. Removal of Parts:**

- a. Remove the following general parts:
- (1) Left and right map compartment assemblies (415-53108 L/R).
  - (2) Fuel gauge assembly from right wing tank (calibrated gauge assembly 415-48011, indicator assembly 415-48013, flange washer 415-48014, and flange gasket 415-48016).
  - (3) Rug Assembly (415-53133).
  - (4) Floorboard assembly (415-53060) and Footrest assembly (415-53059).
  - (5) Leading edge pieces of center section fillets (415-13060 L/R).
  - (6) Leading edge outer panel connection fairings (415-00010 L/R).
- b. Remove the following fuel lines:
- (1) Fuel system left to right tank (interconnecting tube assembly (415-48060).

- (2) Fuel system wing tank to firewall (pump supply) tube assembly (415-48061).

- (3) Fuel system fuselage tank to wing tank (overflow) tube assembly (415-48062).

- c. Remove the two ternplate wing tank assemblies:

- (1) Remove the 10-32 screws that hold tanks to spar.
- (2) Slide tanks off. A slight rotating motion is necessary when removing the right wing tank due to the standpipe that extends inside of fuselage for attachment of the fuel gauge assembly.

**3. Cut-Outs:**

- a. Mark and make tank cut-outs: (Reference Sketch "A" and Sketch "B".)

- (1) Make a template from cardboard, or its equivalent, using Sketch "A" as a pattern.
- (2) Place this template against skin as shown on Sketch "B", inside of fuselage with edges, as marked on Sketch "A", against frame "C" and the top of longitudinal (415-31007). Trace around template to mark outline of required cut-outs.
- (3) Cut fuselage skin with aviation metal snips and trim to lines marked.
- (4) Burr and smooth edges with file.

- b. Make fuel line cut-outs:

- (1) Cut 1-1/4" diameter holes in the skin, on each side, 5-5/8" below the top of the longitudinal (415-31007) and 2-7/8" forward of Frame "C". (Reference Sketch "B").
- (2) Drill or cut a 27/32" diameter hole in Frame "B", 5" above the left longitudinal (415-31007). This hole should be in the center of the section.

**4. Installation of Aluminum Wing Tanks:**

- a. Install aluminum wing tanks: (415-48187R; 415-48147L).
- (1) Fasten the tanks to the spar, using the original 10-32 screws.
  - (2) A minimum clearance of 1/16" is required between the inboard end of the tank and the longitudinal (415-31007). Should this clearance be less than 1/16", it will be necessary to either reform the bulkhead of the tank or elongate the tank attachment screw holes to obtain the proper clearance.

**5. Installation of Fuel System Lines: (Reference Sketch "C"):**

NOTE I: Parker Sealube (6PE), or its equivalent, should be used on all threaded tubing fittings.

NOTE II: No connections should be fully tightened until all plumbing has been installed.

NOTE III: At any point where lines may rub, they should be taped and shel-lacked.

a. Install Fuel System (tank interconnecting) Lines:

- (1) Loosely assemble finger strainer to each wing tank using 90° Universal Elbow (AN776-6D), two gaskets (AN901-6A), and the finger strainer (415-48108).
- (2) Attach tee to left wing tank (inter-connecting) tube assembly (415-48130) to left wing tank 90° Universal Elbow after passing line through 1-1/4" cut-outs in skin, and locate "U" bend to lie flat in the center of air-plane.
- (3) Attach tee (6-6-4JBBBT) to the right end of the interconnecting line.
- (4) Attach the tee to right tank (inter-connecting) tube assembly (415-48109), connecting the tee and 90° Universal Elbow at right wing tank.
- (5) Install the bracket (415-31217) on left tank to tee tube assembly as follows:
  - (a) Loosely attach tube clamps and brackets (415-31217) to each side of left tank to tee (inter-connecting) tube assembly "U" band.
  - (b) Align brackets to outboard sides of fuselage front beam attachments (415-31143L/R).
  - (c) Clamp brackets with "C" clamps to fuselage front beam attachments (415-31143L/R). Be sure there is no excess strain on line.
  - (d) Drill three No. 28 holes in each bracket.

- (e) Attach brackets to stiffener, using three screws (AN632-5) and three nuts (AN365-632).

b. Install Fuel System (pump supply) Line; (Right side of ship).

- (1) Attach valve to "T" (pump supply) tube assembly (415-48110) to tee after inserting between frame "C" and spar.
- (2) Attach Kohler shut-off valve (K-715-HT-4D) to this line.
- (3) Attach valve to union (pump supply) tube assembly (415-48188) to Kohler valve.
- (4) Attach firewall to union (pump supply) tube assembly (415-48165) to above line and fitting at firewall after passing this line through frame "B". Use original rubber grommet in hole at frame "B".

c. Install Fuel System (overflow) Line; (Left side of ship).

- (1) Attach tank to union (overflow) tube assembly (415-48134) to left tank fitting after passing line through new 27/32" hole previously drilled. Install rubber grommet (AN931-8-13) in this hole.
- (2) Attach reducer (AN919-6D) to this above line.
- (3) Remove overflow line elbow from fuselage tank, apply Parker Sealube (6PE), reinstall and tighten so that elbow faces toward left side of the ship.
- (4) Attach union to fuselage tank (overflow) tube assembly (415-48177) to reducer and overflow elbow at fuselage tank.
- (5) Secure this line with a tube clamp at the top of Frame "B".

d. Tighten all fittings and unions to a good snug fit.

**6. Preparation and Installation of Leading Edge Center Section Fillets:**

a. Cover the two original drain plug holes in fillets:

- (1) Cut two round pieces of aluminum 1/2" larger than the original drain plug holes.
- (2) Mark six holes around each piece 1/4" from the edge.
- (3) Match each piece with drain plug holes and drill six No. 40 holes through piece and fillet.
- (4) Rivet each piece to fillet with six AN456AD3-4 rivets.

- b. Reinstall the center section fillets, making the following changes:
- (1) Fasten a map compartment clip (415-53209) on left side and (415-53205) on right side, to the third screw forward of frame "C" in the upper side of fillet.
  - (2) Slip a tube clamp on pump supply tube assembly (415-48188) above Kohler shut-off valve and fasten to the first screw forward of Frame "C" in the upper side of the right hand fillet.
  - (3) Install all screws and nuts in each leading edge fillet except the four in the lower side, and the screws in the bottom side of the front spar.
  - (4) Determine the location of holes in the bottom of each fillet through which the new tank drain plugs will extend. Cut holes 1" in diameter at these determined locations, burr and smooth edges.
  - (5) Glue a 12 x 1/2" felt strip on each side of the fillet, 1/8" from the outboard edge of the fillet between bottom of the tank and the fillet. (Use 3M cement No. 711.)
  - (6) Install all the remaining screws in each fillet. Safety each drain plug to special fillister head screw installed through the fillet into the bottom of the front spar.
  - (7) If there is a gap between the outboard edge of the fillet and the tank, on either side, this can be taken out by shrinking the metal. To do this, place a soft wood or fiber block against the

edge of the fillet and strike with a mallet or hammer. This will change the shape of the fillet and draw it closer to the tank. Continue until a satisfactory fit is obtained.

#### 7. Installation of General Parts:

- a. Install the following parts:
- (1) Leading edge outer panel connection fairings (415-00010 L/R).
  - (2) Cabin floor (415-53060) and Footrest (415-53059).
  - (3) Map Compartment Assemblies (415-53208 L/R). Fasten base of these assemblies with sheet metal screws (AN530-4-6) to new clips (415-53209), previously installed.
  - (4) Rug Assembly (415-53133).
  - (5) Wing tank caps (415-48073).

#### 8. Weight and Balance:

The fuel capacity of the aluminum wing tanks is equal to that of the template tanks. However, the weight of the installation is seven pounds less, and therefore, a new computation of the aircraft's weight and balance is required. This may be accomplished by subtracting the seven pounds from the weight empty and 175 inch pounds (weight x arm) from the empty weight moment. Revise totals and recalculate C.G. location with new data.

#### 9. Repair and Alteration Forms:

This change in the aircraft is a major alteration, so a standard C.A.A. Repair and Alteration Form must be filed.

### Service Department Memorandum No. 39 SERVICE KIT NO. 5, Revised December 30, 1946

Nomenclature	Part No.	Qty. Req.
Bracket; Interconnecting Tube Support.....	415-31217	2
Cup; Assembly Fuel System Wing Tank Filler.....	415-48073	2
Clip; Map Compartment Mounting (right).....	415-53205	1
Clip; Map Compartment Mounting (left).....	415-53209	1
Clip; Tube—Loop type..... (415-31210-25)	AC755-6	4
Compartment Assembly; Map (left).....	415-53208-L	1
Compartment Assembly; Map (right).....	415-53208-R	1
Elbow; Universal 90°..... (415-31210-26)	AN776-6D	2
Felt; 1/8" x 1-1/2" x 11".....	415-13060-5	2
Gasket; Metal tube connection seal..... (415-31210-33)	AN901-6A	4
Grommet; Elastic..... (415-48134-4)	AN931-8-13	1
Nut; Flared Tube bulkhead and universal fitting..... (415-31201-11)	AN924-4D	1
Nut; Self-locking..... (415-31210-12)	AN365-632	10
Reducer; Ext. thread flared tube..... (415-48179-1)	AN919-6D	1
Rivets; Brazier head.....	AN456AD3-4	6
Screw; Round head machine..... (415-31210-23)	AN515-6-5	6
Screw; Round head machine..... (415-31210-16)	AN515-6-6	4
Strainer Assembly; Wing tank finger.....	415-48108	2
Tee..... (415-31210-52)	6-6-4JBBBT	1
Tube Assembly; Firewall to union.....	415-48185	1
Tube Assembly; Left Wing Tank to Union.....	415-48134	1
Tube Assembly; Pump Supply.....	415-48110	1
Tube Assembly; Tee to left tank.....	415-48130	1
Tube Assembly; Tee to universal elbow.....	415-48103	1
Tube Assembly; Union to fuselage tank.....	415-48177	1
Tube Assembly; Valve to union.....	415-48188	1
Union; Flared tube..... (415-31201-14)	AN815-40	1
Washer; Plain..... (415-31201-23)	AN960-A716L	2
Valve; two-way plug..... (415-31210-53)	K-715-HT-4D	1

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MAKE CARDBOARD TEMPLATE  
CUT ALONG BROKEN LINES

BEND TEMPLATE TO CONFORM WITH CONTOUR OF FUSELAGE  
SIDE WHEN SCRIBING OUTLINE

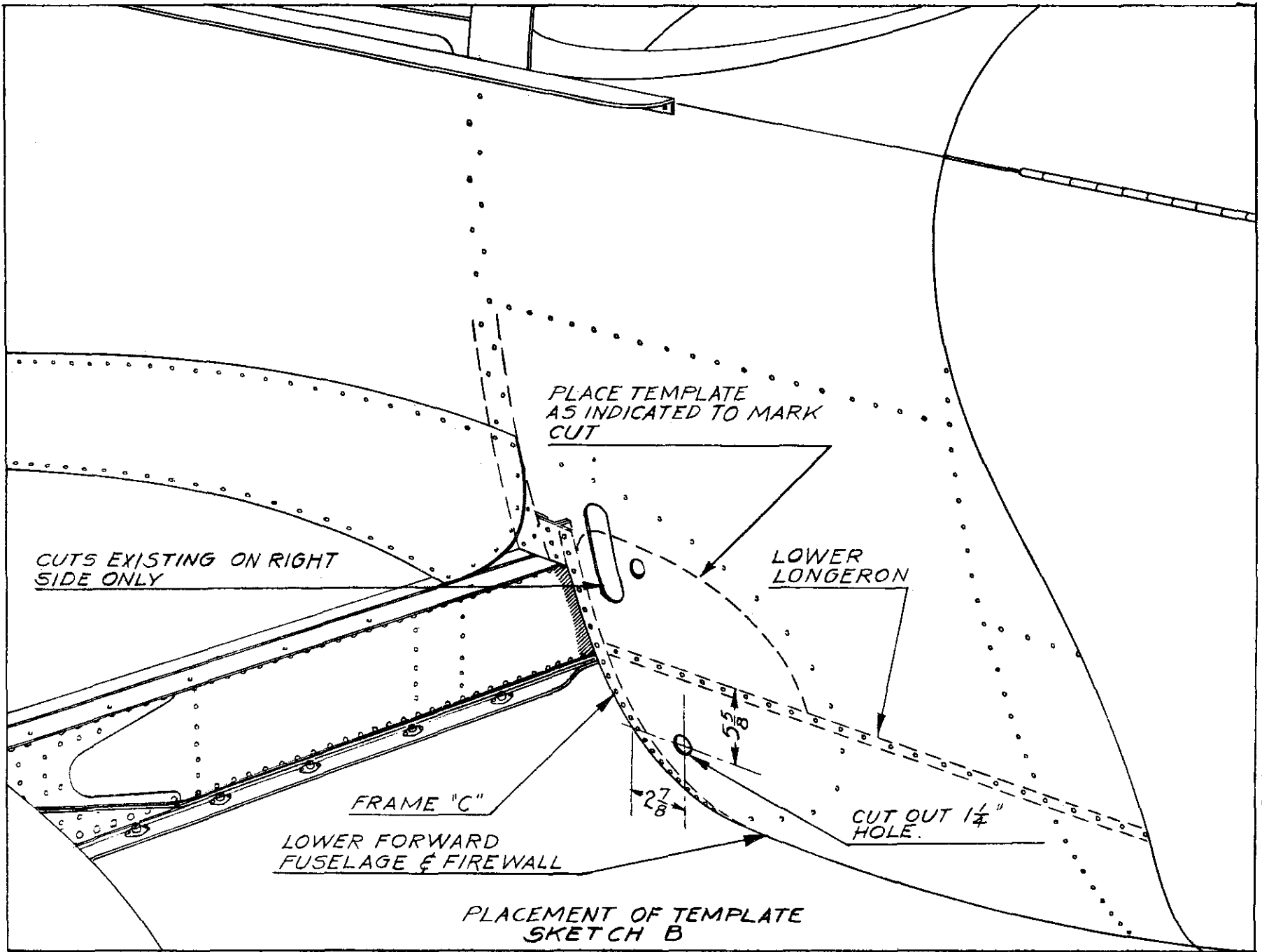
CUT-OUT TEMPLATE  
USE TO CUT AWAY FUSELAGE ON ERCOUPES,  
SERIAL NOS. 813 TO 2622 INCL WHEN REPLACING  
TEMPLATE WING TANKS WITH ALUMINUM TANKS

REVERSE --- FOR RIGHT HAND SIDE

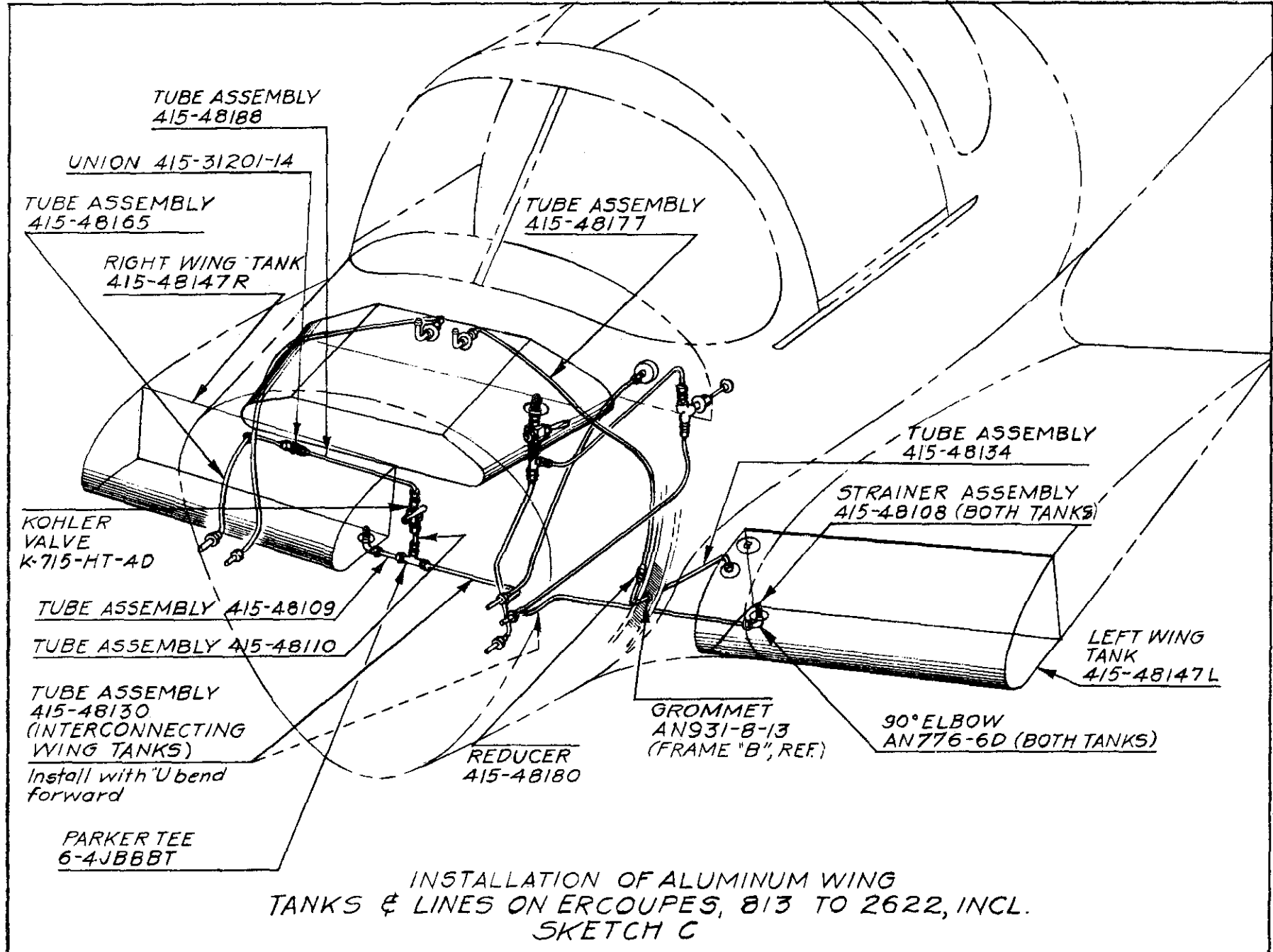
PLACE FLUSH AGAINST EDGE OF LOWER LONGITUDINAL

PLACE THIS SIDE FLUSH AGAINST  
EDGE OF FRAME "C", LOWER  
FORWARD FUSELAGE

SKETCH A



ERCOUPE SERVICE DEPT MEMORANDUM  
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TUBE ASSEMBLY  
415-48188

UNION 415-31201-14

TUBE ASSEMBLY  
415-48165

RIGHT WING TANK  
415-48147R

TUBE ASSEMBLY  
415-48177

TUBE ASSEMBLY  
415-48134

STRAINER ASSEMBLY  
415-48108 (BOTH TANKS)

KOHLER  
VALVE  
K-715-HT-4D

TUBE ASSEMBLY 415-48109

TUBE ASSEMBLY 415-48110

LEFT WING  
TANK  
415-48147L

TUBE ASSEMBLY  
415-48130  
(INTERCONNECTING  
WING TANKS)

Install with "U" bend  
forward

REDUCER  
415-48180

GROMMET  
AN931-B-13  
(FRAME "B", REF.)

90° ELBOW  
AN776-6D (BOTH TANKS)

PARKER TEE  
6-4JBBBT

INSTALLATION OF ALUMINUM WING  
TANKS & LINES ON ERCOUPES, 813 TO 2622, INCL.  
SKETCH C

ERCOUPE SERVICE DEPT. MEMORANDUM  
NUMBER 39