PITTS AVIATION ENTERPRISES, INC.

SERVICE BULLETIN NO. 7

APPLICABILITY: Accomplishment of this Service Bulletin is mandatory. This Bulletin applies to Pitts Model S-2A airplanes from Serial No. 2001 through 2049. (S/N 2050 and up will be modified at the factory.)

PURPOSE: To prevent failure of the horizontal stabilizer leading edge tube.

DISCUSSION: It has come to our attention that the leading edge tube of the horizontal stabilizer, (P/N 2-3100-12), has been found to be cracked at the inboard end, at and near the vertical AN3 bolts which secure the stabilizer leading edge tubes to the leading edge support tube, P/N 2-2123.

There has been previous evidence of distress in this area as was noted in Pitts Service Bulletin No. 6.

It is our belief at this time that the cracks are being caused by three contributory factors. These are: Tightening the AN3 bolts at the root of the stabilizer leading edge so that the tube is deformed out of round; picking up the tail of the airplane by the stabilizer leading edge outboard of the root; and in-flight vibration of the stabilizer leading edge tube.

In any event the repair and rework described in this Bulletin will, we believe, prevent further damage to this part of the airplane.

ACCOMPLISH THE FOLLOWING:

1. Remove the left and right horizontal stabilizers as follows: (NOTE: Keep track of all hardware and replace the same parts in their original locations except as noted.)
   a) Disconnect the elevator trim tab push rods from the horns beneath the stabilizers, leaving the rods connected to the tab horns. (NOTE: Some airplanes may have AN 310-1032 nuts and AN 380 cotter pins installed on these AN3 bolts instead of AN365-1032 nuts. If so, you may either reinstall the AN310-1032 nuts with new cotter pins, or replace with AN365-1032 nuts and undrilled AN3 bolts.)
   b) Remove the two AN4 bolts through the tail brace wire lugs and elevator hinges, left and right. (NOTE: It is not necessary or desirable to loosen the tail brace wires.)
   c) Remove the four AN3 bolts through the stabilizer leading edge and trailing edge tubes, left and right. Remove the stabilizer root fairings.
   d) Remove the access plates adjacent to the stabilizer

trailing edge, reach inside the aft fuselage and remove the two AN3 bolts through the elevator trim control shaft. Note that it is not necessary to disconnect the elevator horn.

e) Remove the left and right stabilizers by pulling them straight outboard.

2. Thoroughly clean with solvent the root region of the stabilizer leading edge tubes. Dye check these tubes from the inboard rib to the inboard end of the tube, and inspect for cracks using a ten-power glass, paying special attention to the region of the bolt holes.

a) If cracks are noted, accomplish the following; if no cracks are found, proceed to step 3.

i) Cut the fabric off the stabilizer root region within a radius of about three inches from the intersection of the root rib and the leading edge tube.

ii) Weld the cracks closed. (NOTE: Either shielded-arc or oxy-acetylene welding may be used.)

iii) Using a file, carefully dress the welded areas down to the original tube diameter, both on the inside and the outside.

iv) Measure the distance from the inboard end of the stabilizer leading edge tube to the center of the AN3 bolt holes.

v) Slip the repair sleeve, (P/N 2-3100-12-1, available from Aerotek, Inc., P.O. Box 547, Afton, Wyoming 83110), over the inboard end of the stabilizer leading edge tube so that the squared-off end of the repair sleeve is flush with the inboard end of the stabilizer leading edge tube, and the finger tab on the repair sleeve is to the front.

vi) Weld, (by shielded-arc or oxy-acetylene), the repair sleeve all around its outboard edge to the stabilizer leading edge tube. (Do not weld the inboard edge.)

vii) Using the measurement obtained in step iv) above, drill a No. 10 hole, (.193 to .199 dia.), vertically through the repair sleeve so that the new hole coincides with the original hole in the stabilizer leading edge tube.

viii) Zinc chromate all bare metal surfaces in the vicinity of the repair, re-cover with fabric, and repaint.

b) If no cracks are found, proceed to step 3. below, and note that all airplanes in the referenced Serial No. block must comply with the remainder of this Bulletin whether or not cracks were found in step 2. above.

3. Obtain Service bulletin No. 7 Modification Kit from Aerotek, Inc., Afton, Wyoming. (This is in addition to the 2-3100-12-1 repair sleeve, if it is required.) This repair kit contains the following parts:

a) 2-3100-23 bushing (2 required)
b) 2-2117 "B" fitting (butterfly shape), (1 required)
c) 2-3100-25 (left-hand) brace tube (1 required)
d) 2-3100-24 (right-hand) brace tube (1 required)

e) and hardware as follows:
for upper ends of brace tubes:
AN3-13A bolt (2 required)
AN365-1032 nut (2 required)
AN960-10 washer (2 required)
for lower ends of brace tubes:
AN161-32 RS fork (2 required)
AN4-7A bolt (2 required)
AN960-416 washer (4 required)
AN365-428 nut (2 required)
AN316-4 nut (2 required)
AN960-416L washer (2 required)

4. Locate the second rib inboard from the tip, on each horizontal stabilizer, left and right. Remove the fabric within a radius of about three inches from the intersection of this rib and the stabilizer leading edge, top and bottom. Measure 3/8 inch outboard from the outboard face of this rib and mark the leading edge tube. Drill a 5/16 inch diameter hole vertically through the leading edge tube, on the center line of the tube, 3/8 inch from the outboard face of the second rib from the tip. Center the 2-3100-23 bushing in this hole and weld in place all around both top and bottom. Zinc chromate bare surfaces in this area, re-cover with fabric and repaint. (NOTE: Where it is necessary to remove rib stitching to allow welding, replace rib stitching per FAA Advisory Circular AC43.13.1)

5. Raise the tail of the airplane onto a sawhorse or similar support. Disconnect lower horizontal tail brace wires inboard ends from 2-2117 strap under tailspring forward end, by removing the cotter pins and withdrawing the clevis pins. Do not turn the wire in the clevis or loosen the clevis lock-nut. Remove the AN6 bolt from the tailspring forward end and discard the old 2-2117 constant width strap. Install the two AN161-32RS forks in the two forward holes of the new 2-2117 butterfly strap, (before the strap is installed on the airplane), as follows: Orient the butterfly strap with the straight side aft and the tabs inclining up. Insert one AN960-416 washer between the lower lug of the fork and the 2-2117 fitting, and one AN960-416L washer between the 2-2117 fitting and the upper lug of the fork. Then insert the AN4-7A bolt down through the fork, washers and fitting. Put an AN960-416 washer on the bolt and screw on an AN365-428 nut. Then, with both AN161-32 RS forks on the butterfly fitting, and with the bolt heads up, install the new 2-2117 butterfly shape strap under the tailspring forward end with the straight edge of the strap to the rear and the tabs up. Replace the AN6 forward tailspring bolt, with its nut and washer, so that the bolt picks up the 3/8 inch hole in the center of the butterfly strap. Reconnect the lower horizontal tail brace wires inboard ends to the two aft holes in the butterfly strap, using the same hardware but new AN380 cotter pins.

6. Reassemble horizontal stabilizers on airplane in reverse

order of steps 1. a) through 1. e) above. NOTE: When reinstalling the AN3 bolts through the stabilizer leading and trailing edge tubes, be extremely careful to tighten the AN365-1032 nuts only sufficient to eliminate free axial play on the bolt, but not enough to deform or pre-stress the tubes. Also, note that if the repair sleeve of step 2. a) v) is installed, the AN3 bolt at the stabilizer leading edge tube must be replaced with an AN3 bolt 1/8 inch longer than the original.

7. Install 2-3100-24 and -25 (right and left) brace tubes as follows:

a) Check to be sure the tube is being installed on the correct side of the airplane by aligning the brace tube between the 2-3100-23 bushing lower end, (installed in step 4. above), and the fork in the butterfly fitting, (installed in step 5. above), and checking that the bend of the upper end of the brace tube is parallel to the stabilizer lower surface while the tube is streamlined fore and aft, with the sharper radius of the tube cross section to the rear. Then, with the AN316-4 check nut screwed all the way onto the AN161-32 RS fork, screw the lower end of the brace tube onto the fork, until the hole in the upper end of the brace tube is aligned with the hole through the 2-3100-23 bushing.

b) Now insert the AN3-13A bolt, with the bolt head up, through the 2-3100-23 bushing and the hole in the brace tube upper end. Install AN960-10 washer and AN365-1032 nut. Then, at the lower end of the brace tube, tighten the AN316-4 nut on the fork against the end of the brace tube. NOTE: Adjustment is provided at the lower end of the brace tube so that when it is installed there is neither a tensile nor a compressive strain on the tube. In the event the adjustment provided is not sufficient, it is permissible to grind or file approximately 3/16 inch off the protruding end of the threaded bushing which is welded into the lower end of the brace tube at the factory. Do not cut the threaded bushing off any further than the end of the brace tube itself.

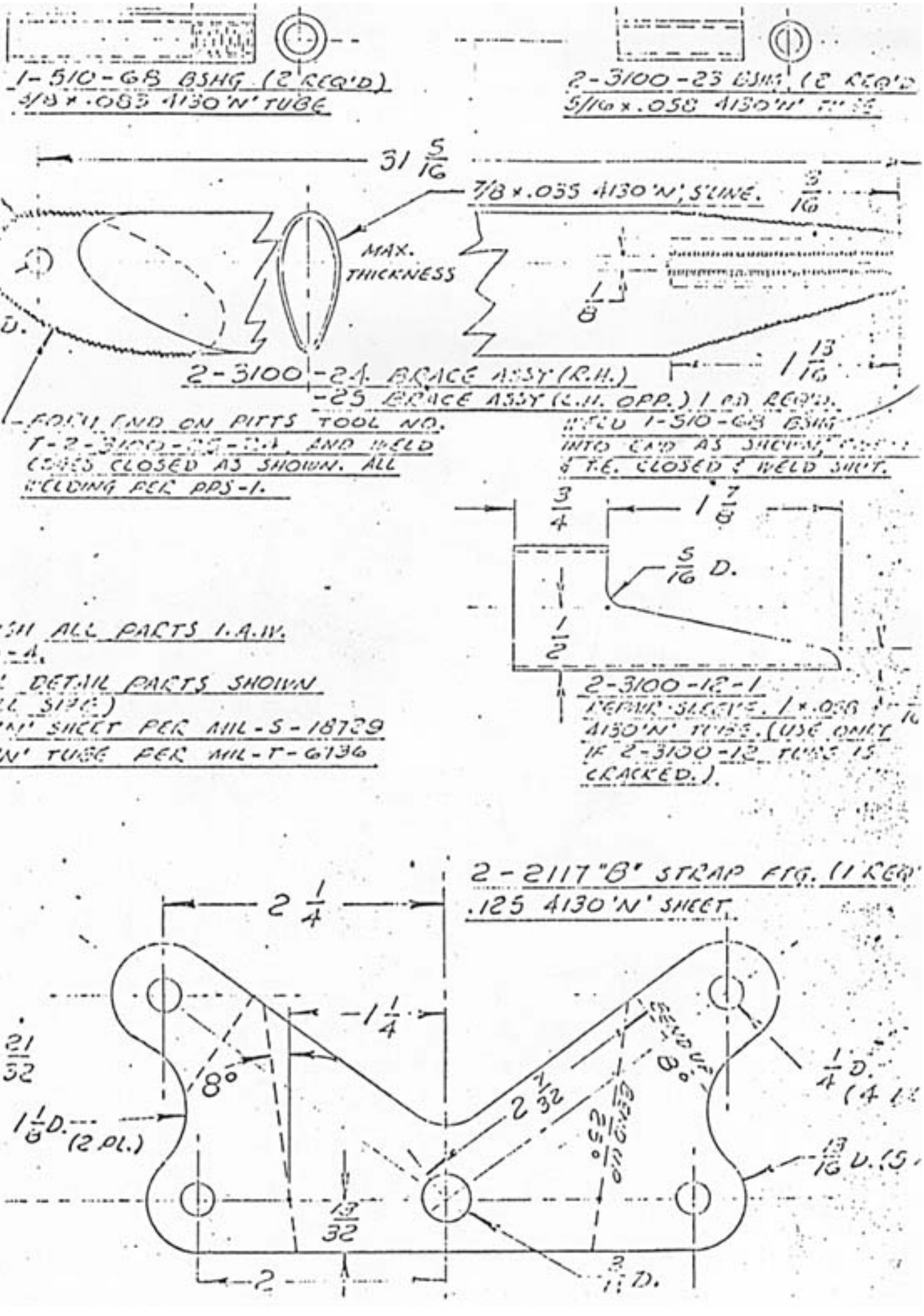
c) The brace tube may be painted to match the airplane color scheme.

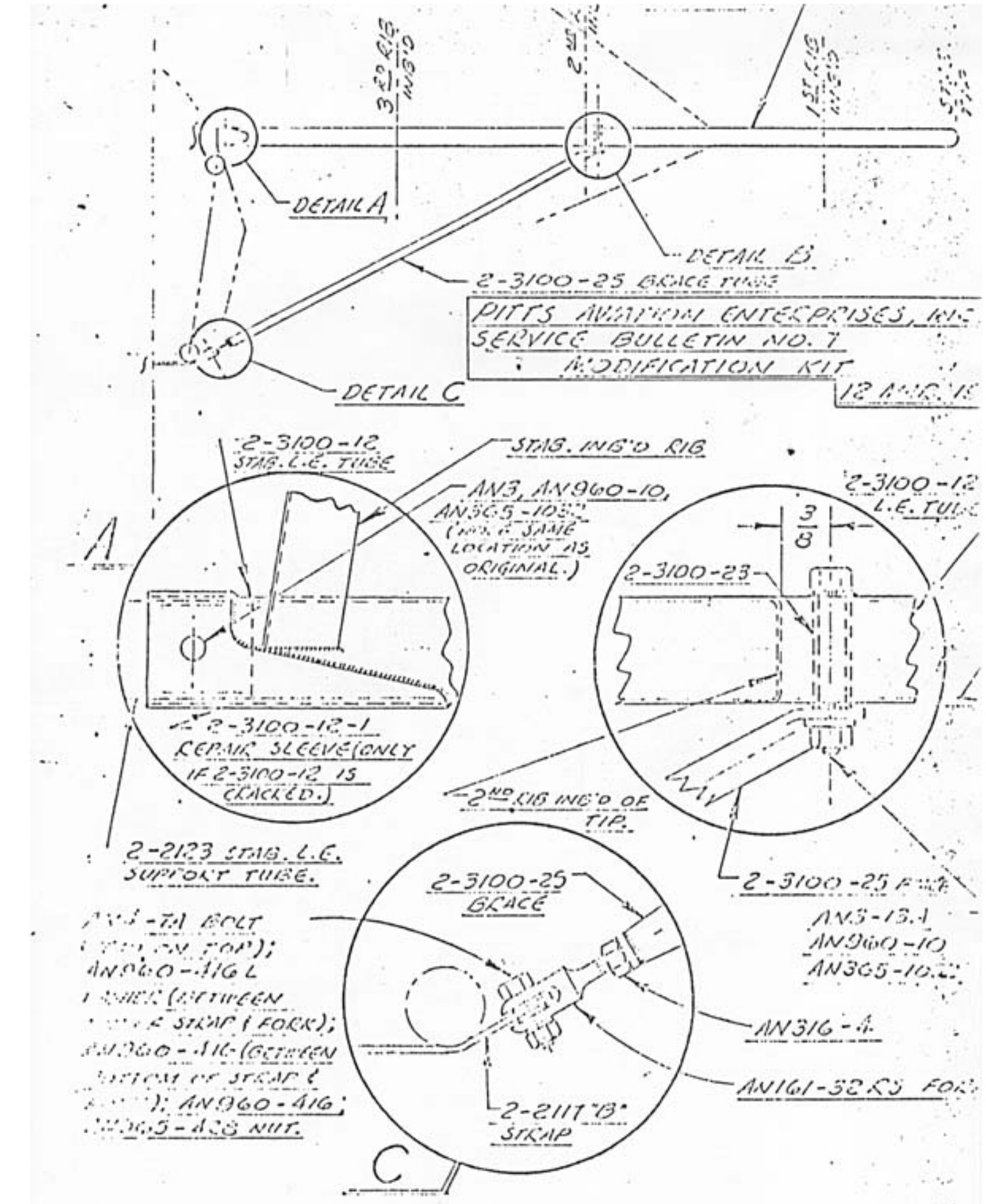
8. Recheck all fittings and hardware for safety, security and alignment.

COMPLETION: Upon completion of the work described in this Bulletin, the periodic inspections of the FAA Emergency Airworthiness Directive letter dated March 9, 1973, same subject, may be discontinued.

FAA APPROVED

PITTS AVIATION ENTERPRISES, INC.
E. F. Dearing, Chief Engineer


1-510-6B BSHG (2 REQ'D)
4/8 x .083 4130 'N' TUBE
2-3100-23 BSHG (2 REQ'D
5/16 x .058 4130 'N' TUBE
31 5/16
7/8 x .035 4130 'N' SLIME.
3/16
MAX. THICKNESS
1/8
5/16 D.
1 13/16
2-3100-24 BRACE ASSY (R.H.)
-25 BRACE ASSY (L.H. OPP.) 1 EA REQ'D.
-FOR'D END ON PITTS TOOL NO. T-2-3100-22-2A AND WELD SEAMS CLOSED AS SHOWN. ALL WELDING PER AMS-1.
WELD 1-510-6B BSHG INTO END AS SHOWN. FOR'D & T.E. CLOSED & WELD SHUT.
3/4
1 7/8
5/16 D.
1/2
2-3100-12-1
REPAIR SLEEVE. 1 x .035 4130 'N' TUBE. (USE ONLY IF 2-3100-12 TUBE IS CRACKED.)
* FINISH ALL PARTS I.A.W. AMS-4.
(ALL DETAIL PARTS SHOWN FULL SIZE)
4130 'N' SHEET PER AMS-S-18729
4130 'N' TUBE PER AMS-T-6736
2-2117 "B" STRAP FTG. (1 REQ'D
.125 4130 'N' SHEET
2 1/4
1 1/4
1 21/32
18°
1 1/8 D. (2 PL.)
2 1/32
BEND UP 8°
BEND DOWN 23°
1/4 D. (4 PL.)
13/16 D. (5 PL.)
13/32
2
3/4 D.


3ED RIB ING'D
2ND RIB ING'D
1ST RIB ING'D
DETAIL A
DETAIL B
DETAIL C
2-3100-25 BRACE TUBE
PITTS AVIATION ENTERPRISES, INC.
SERVICE BULLETIN NO. 7
MODIFICATION KIT
2-3100-12
STAB. L.E. TUBE
STAB. ING'D RIB
AN3, AN960-10,
AN365-1032
(INST. IN SAME
LOCATION AS
ORIGINAL.)
A
2-3100-12-1
REPAIR SLEEVE (ONLY
IF 2-3100-12 IS
CRACKED.)
2-3100-12
L.E. TUBE
3/8
2-3100-23
2ND RIB ING'D OF
TIP.
2-2123 STAB. L.E.
SUPPORT TUBE.
2-3100-25
BRACE
AN3-7A BOLT
(BOTTOM FOR);
AN960-416L
WASHER (BETWEEN
BRACE STRAP & FORK);
AN960-416 (BETWEEN
BOTTOM OF STRAP &
FORK); AN960-416
WASHER; AN365-428 NUT.
AN3-13A
AN960-10
AN365-1032
AN316-4
AN161-32KS FOR
2-2111 "B"
STRAP
C