THE DON LUSCOMBE AVIATION HISTORY FOUNDATION
A non-profit group dedicated to preserving the Luscombe Aviation Heritage

Luscombe Silvaire model 8 Aircraft Type Certificate Holder

November 28, 1993

SERVICE RECOMMENDATION #1

APPLICABILITY: All model 8 series Luscombes with round tipped vertical stabilizer installations. Service difficulties noted in the past 30 years of Luscombe operation point out the need to inspect and probably replace the front vertical fin attach fitting on these aircraft.

Installation instructions for Luscombe "8" series, forward vertical fin attachment fitting PN 28455.

PART IDENTIFICATION: There are four fittings used in this application on round tipped vertical fin Luscombe 8 series aircraft. Since all fittings and vertical fins are designed to be interchangeable among Luscombes, serial applicability is not available.

Early production Luscombes used a thin steel fitting PN28415 which is identified by the U channel shape at the flange where it bolts on the forward edge at fuselage bulkhead #7 with 4 AN3-11 bolts. This part was later discussed in Luscombe service bulletin number 7 where it was recommended that it be replaced with an updated part.

Later round tip production used the updated cast aluminum forward attach fitting PN28444 or 28453(superceding) on vertical stabilizer installations. These have been found in service to be porous and subject to internal corrosion that may not be readily detectable through visual inspection, rendering the need for AD 79-25-05.

Subsequent to AD 79-25-05, A non-factory supplier developed a PMA 4130 steel part to replace the cast aluminum fitting in compliance with paragraph "b." of the Advisory directive. These parts are considered a suitable replacement and meet the qualifications of the AD.

As the Luscombe ATC holder, we have developed a 4130 steel replacement part # 28455 and had it reviewed for structural integrity, finding it superior in all regards to the prior factory parts. This part is identifiable by the epoxy primer and "swept" web at the front mounting flange.

The Luscombe Foundation is planning to offer this FAA approved part #28455 and installation kit to meet the compliance requirements of AD 79-25-05 and those standards expected to be imposed by an AD revision of AD 79-25-05 due for release in mid 1994.

TIME REQUIRED: approximately 4 hours

TOOLS REQUIRED: 3/8 box end wrench, 3/8 socket with at least a 6"extension (wobble preferred), 7/16 box end wrench and 7/16 socket, long drift or punch, 6 oz. hammer, a 6" x 8" scrap of .020 or .025 aluminum, a small flashlight, inspection mirror, a small screwdriver, and piers. A drill & 90 degree adapter. drills size #21 & #30, a rivet hammer and appropriate sets will also be needed.

1. If installed, Disconnect the battery ground lead or mark the master and navigation lights switches so that they will not be operated.

2. Just above the tailwheel, between the rudder and vertical stabilizer, locate the navigation light wire and disconnect it. Tape the loose end on the fuselage side so that it does not slip into the tailcone.

3. Count the number of washers, and the location of the washers on the rudder hinge pins. Note this for re-assembly and rigging.

4. Using your screwdriver, remove both triangular fairings between the vertical and horizontal stabilizer.

5. Remove the rudder control and tailwheel control mounting hardware. Now is a good time to inspect the rudder horn holes for wear and elongation.

6. Remove the lower rudder hinge pin bolt and nut from the lower rudder hinge.

7. Remove the upper rudder hinge pin bolt and nut from the upper rudder hinge. Have an assistant secure the rudder and use the small screwdriver to gently pry loose the rudder from the hinge pins. Note the hinge pin condition and replace them if groved. The pins and washers may drop out, so be prepared to catch them. Remove the rudder and set it aside in a safe place.

8. Loosen the three mounting bolts at the rear vertical stabilizer attach fitting. Using the scrap aluminum to protect the elevator fairings and horizontal rear spar area, drive and pull the top (long) mounting bolt out and set it aside.

9. Move to the front vertical stabilizer fitting and loosen all four of the mounting bolts. Use your screwdriver and pliers to remove them. Note and record the number of shims between the fitting and bulkhead #7.

10. Move to the rear fitting of the vertical stabilizer and remove the two lower (short) mounting bolts. The vertical stabilizer should be free of the aircraft and ready for the fitting replacement operation.

11. Mounting of the vertical fin to remove the front attachment fitting is best done by supporting the rear spar on the bench or in a vice with 1/2 inch plywood supporting the skins on each side.

12. Using a small square or piece of cardboard measure from the center of the first spar side rivet to the centerline of the tubing in the old fitting. Note this dimension. It will be duplicated when installing the new fitting.

13. Now is a good time to use your flashlight and mirror. We suggest removing the lower rudder hinge bracket and closely inspecting bulkhead #8 from both inside and outside, for cracks in this area. The number 8 bulkhead takes a lot of abuse and needs frequent inspection and attention. Cracks can occur in this area from tailwheel shimmy and improperly adjusted rudder cables. Remount the hinge bracket after inspection is complete.

14. Move to bulkhead #7 and do a detailed inspection of this bulkhead from both inside and outside. Pay particular attention to cracks near and around the steel reinforcement horseshoe that is in the top section where the front fin fitting bolts up. Also use a bright light in the tail cavity between bulkheads #7 & #8. From the rear side with a mirror, closely inspect the front horizontal stabilizer bracket for cracks and corrosion. Inspection complete,-back to the fin.

15. After firmly mounting the fin on the bench, center punch the bottom 6 rivets on both sides of the front spar as well as the four mounting rivets accessible from under the leading edge or behind the rear of the fitting.

16. Select a #30 drill and remove the side rivets in the spar that go through the front fitting.

17. Mount a #21 drill and remove the 4 larger rivets in the spar web. This is best done with an angle drill attachment, though it can be done with a regular drill, or small cold chisel-ON THE FITTING SIDE.

18. The tail fitting Installation is accomplished by locating the new fitting in the spar and measuring the dimension from the tube centerline to the first rivet hole as noted in step #12 during disassembly. Having done this, drill two holes, one on each side of the spar/fitting and locate the fitting with a screw or cleco temporarily.

19. With the temporary mounting, re-fit the stabilizer to the aircraft as a trial, and install shims to be sure that there is little or no preload on the rear spar mounting attachment holes. It is permissible to shim the fitting with 2024 T3 sheet stock if needed to align the holes and avoid preload on the fittings at the rear spar. shims are available from the Foundation parts inventory.

20. Once satisfied with the installation fit, remove the fin and locate the remaining mounting holes.

21. Corrosion proof the fitting to spar mating area with a dielectric tape, epoxy primer, or other suitable means to deter corrosive interaction between the metals at the installation joint.

22. Install rivets in the sides of the spar. You may use either 5/32" 2117 (dimplehead) rivets or AN3-2A bolts with elastic stop nuts in the 4 rivet holes located in the spar web. Riveting in this area after the part has been closed out is difficult and the bolt installation is cleaner, neater, and just as secure.

24. Re-install the fin using enough shims to reduce preload on the fittings and fin side skins. They should not pull or ripple.

23. Complete the installation of the vertical fin using the reverse procedure of items #10, 9, 8 through 1.

torque the front fin fitting AN3 bolts to 20-23 in#.
torque the rear fin fitting AN4 bolts to 50-65 in#.

25. When rigging the rudder be sure to consult the TC data sheet for limits. Rig the rudder so as to not cause a side load in the lower hinge point.

26. Complete an FAA 337 form and airframe logbook entry to return the aircraft to service.

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