

SERVICE HELPS AND HINTS #26

TO ALL DISTRIBUTORS AND DEALERS

SUBJECT: ENGINE COOLING

Models and Serial Numbers Affected:

Models 7AC "Champion" - all, 11AC "Chief" - all, and 11AC-S "Scout",  
all

Purpose:

To provide various means for lowering oil, cylinder head and cylinder barrel operating temperatures.

Date to be Accomplished: No deadline - Optional

Drawings and Parts Required:

1. One (1) 4-732 Lower Firewall Baffle
2. One (1) Print, Aeronca Drawing No. S-15 (Firewall Alteration - for cooling system conversion)
3. One (1) Print, Aeronca Drawing No. S-16 (Nose bowl Alteration - for cooling system conversion)
4. One (1) Print, Aeronca Drawing No. S-17 (Wraparound Alteration - for cooling system conversion)
5. One (1) Print, Aeronca Drawing No. S-18 (Rear Cylinder Baffle Anchorage for cooling system conversion)

General Description:

We have just completed a test program, initiated to investigate methods of improving engine cooling. This program was initiated with a two-fold purpose:

- a. To enable operators to prolong engine life and increase operating time between overhauls and thereby lower their ultimate maintenance costs by providing a cooler operating engine.
- b. To investigate certain reports that the engine was overheating in certain hot climates or in unusually hot weather.

The cooling is considered satisfactory providing (a) the baffle leathers are kept bent forward and sealed against the cowling (b) the baffle fits themselves are maintained and (c) the airplane is climbed during periods exceeding one (1) minute duration at a true airspeed of over 60 m.p.h. (approximately the speed of best rate of climb of these two airplanes at normal operation altitudes). When this is done, and when the maximum outside air temperature does not exceed 100 degrees F., the engine will, in all probability, not exceed the following allowable temperature limits:

Oil = 220 degrees Fahrenheit  
Cylinder Heads = 550 degrees Fahrenheit  
Cylinder Barrels = 350 degrees Fahrenheit

These allowable temperatures assume an ambient or outside air temperature of 100 degrees F. and are corrected temperatures. Therefore, if the indicated

oil temperature plus the difference between 100° and the ambient outside air temperature does not exceed 220°, the oil temperature is below the allowable limit.

**Example:**

Indicated Oil Temperature = 185° F,  
At Ambient (Outside) Air Temp. = 70° F  
 $100^{\circ} - 70^{\circ} = 30^{\circ}$  temp. difference  
Corrected Oil Temperature = Indicated + difference =  
=  $185 + 30 = 215^{\circ}$  F  
This is 5° below the allowable limit of  
220° F and therefore satisfactory.

For installations where (a) oil temperatures, corrected as above, exceed 220°, (b) outside air temperatures are expected to exceed 100° F, or (c) where maximum engine life and operating time between overhauls is required, the alterations, shown by the attached sketch, were devised and alteration #1 is strongly recommended at the earliest practicable date. For these operators, unable to accomplish alteration #1, alteration #2 or #3 should be accomplished promptly and the remainder of the alteration made at the earliest convenience. These alterations are covered by the following drawings:

Alteration #1 - Enlargement of Nose Bowl - "Bug Eyes" and Enlargement of Air Outlet at Firewall Tunnel.

All drawings listed above. One (1) 4-732 Lower Firewall Baffle will be required.

Alteration #2 - Enlargement of Air Outlet at Firewall Tunnel Only.  
Drawing Nos. S-15, S-17, and S-18 only.

Alteration #3 - Enlargement of Nose Bowl "Bug Eyes" only.  
Drawing No. S-16 and Drawing No. S-18 only.

It will not be necessary to remove the firewall but only the nose bowl to perform these operations.

It will be noted that in all of the above alterations, the anchoring of the rear cylinder baffles to the rear cylinders as shown by drawing No. S-18 is recommended. It is also recommended, in all alterations, that the baffle leathers be replaced by either new leather or by felt stripping in cases where the leather has become oil soaked or has otherwise lost its stiffness and has drooped over, thus forming an ineffective air seal.

Results of our cooling tests, during which each of these alterations were tested on a standard production Champion, indicate that the alterations can be expected to accomplish, in the average installation, the following temperature reductions:

	Average Corrected Temperature, Degrees F		
	<u>Oil</u>	<u>Cylinder Head</u>	<u>Cylinder Barrel</u>
Standard Airplane with no alterations	217	515	263
Alteration #3, Nose Bowl "Bug Eyes"	205	496	259
Alteration #2, Air Outlet at Firewall	200	477	248
Alteration #1, all	189	451	246

These temperatures were obtained in a continuous climb at 55 m.p.h. true airspeed and it can thus be seen that the alterations result in the following average temperature reductions to the standard airplane under these conditions:

	<u>Oil</u>	<u>Cylinder Head</u>	<u>Cylinder Barrel</u>
Alteration #3	12	19	4
Alteration #2	17	38	15
Alteration #1	28	64	17

Drawings, #S-15, S-16, S-17, and S-18 are attached for your reference and guidance. Further instructions are included on the drawings.

Part Number 4-732, Lower Firewall Baffle, is available for \$1.75, A discount.

AERONCA AIRCRAFT CORPORATION  
 SERVICE AND PARTS DEPARTMENT  
 MIDDLETOWN, OHIO

P. H. Scherer  
 P. H. SCHERER, MANAGER

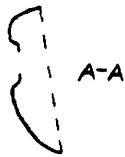
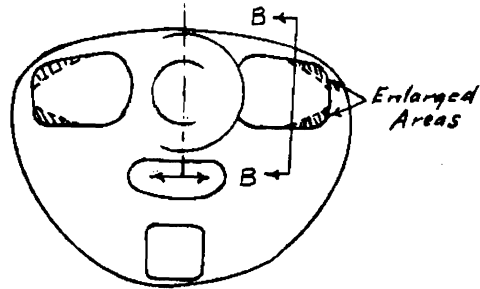
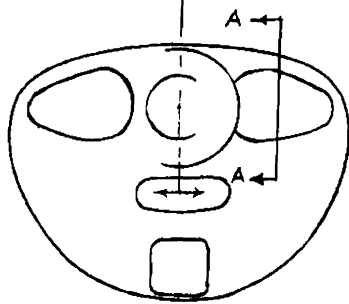
JUNE 5, 1947

BEFORE ALTERATION

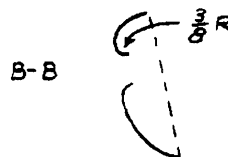
AFTER ALTERATION

Airplane Without Starter ← Airplane With Starter

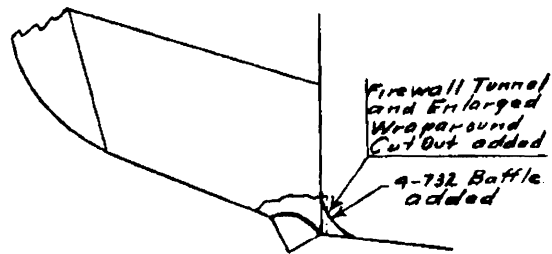
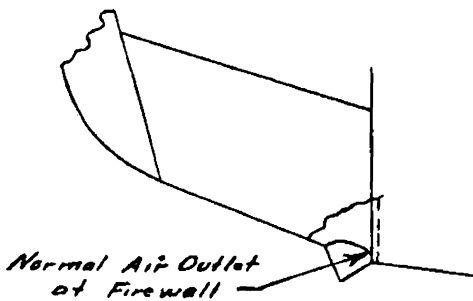
Airplane Without Starter ← Airplane With Starter



Section Thru "Bug Eyes"



Alteration #3 - Nose Bowl Alteration - Dwg Nos S-16 and S-18 Required



Alteration #2 - Firewall & Wraparound  
Alteration - Dwg Nos S-15, S-17 & S-18  
Required. One (1) 4-732 Baffle Req'd.

Alteration #1 = Combination of Alterations  
#2 & #3 - Dwg No's S-15, S-16, S-17  
& S-18 Req'd. One (1) 4-732 Baffle  
Req'd.