

The Warner Aircraft Corp.
20263 Hoover Ave.
Detroit, Mich.

Service Letter No. A-10

May 2, 1942

(supersedes April 22, 1942 issue)

Subject: Replacement, during next overhaul, of exhaust valve springs on late series 125 HP Scarab and 145HP Super Scarab engines equipped with Nos. 7739 and 7610 exhaust valves respectively, and carburetor idling Adjustments.

- To: 1) All owners of Series 50 125 HP Scarab engines up to and including Serial No. 1238 and of series 40 engines Nos. 1063, 1065, 1066.
- 2) All owners of series 40 Super Scarab engines serial no. 104 and up and of all Super Scarab series 50 engines except the following serial nos:
438, 460, 474, 500, 680, 684, 716, 808, 874, 933, 934, 935, 938, 948, 949.
- 3) All authorized Warner Aircraft Corp. Service Representatives.

Replacement of Exhaust Valve Springs:

1. A thorough investigation conducted recently has definitely established the fact that occasional failures of exhaust valve No. 7739 in late 125 HP engines and of exhaust valves no. 7610 in late 145 HP engines must be attributed to the valve springs No. 7740 and 7741 used in these engines. The valves in question can be identified by having 1.448" stem diameter and .391" groove diameter for the valve spring washer retainer.
2. Early 125 HP engines were equipped with 7260 exhaust valve having .401" diameter valve stems and .250" diameter of the valve spring retainer groove. These valves were used with Nos. 7131 and 7132 valve springs. Early 145 HP engines were equipped with 7552 exhaust valves having .448" stem diameter and .281" diameter of the valve spring retainer groove. These engines were equipped with No. 7294 outer valve spring and No. 7131 inner valve spring. These early engines, covered by this paragraph, are not affected by this Service Letter and the springs in them are not to be changed.
3. It is recommended that at the time of the next overhaul and preferably at the first top overhaul, subsequent to receipt of this bulletin, of late series 125 HP engines equipped with 7739 exhaust valves, and of late 145 HP engines equipped with No. 7610 exhaust valves, the exhaust valves be carefully inspected and the valve springs changed as outlined below.
4. The exhaust valves, part no. 7739 of the 125 HP engines are made from a magnetic steel and can be magnafluxed. The exhaust valves, part No. 7610 of the 145 HP engines are made from austenetic steel and are, therefore, not magnetic. These valves, therefore, must be carefully cleaned of all deposits and then carefully examined. For this inspection, the valve may be etched in a weak nitric acid solution (one part of nitric acid to ten parts of water) or with Marple's reagent, which is made by mixing 4 grams of Copper Sulphate, 20 cc. of Hydrochloric Acid, and 20 cc of water. These solutions can be purchased for a few cents ready-mixed at any drugstore.

After the acid has been left in contact with the entire valve long enough to cause a dulling of the surfaces it should be washed off thoroughly with hot water to stop the action of the acid. Inspect carefully with a magnifying glass then oil thoroughly to prevent rusting. It is suggested that exhaust valves which have already been in service 600 hours or more be replaced by new valves.

5. If you have already experienced exhaust valve heat failures on your engine or are operating under conditions of high cooling air temperatures and/or excessive periods of full throttle operations, it is suggested that this inspection and replacement be made at the first top overhaul subsequent to receipt of this bulletin.

6. After this inspection install the exhaust valve with new valve springs, Warner PN 7965 outer valve spring and no. 7966 inner valve spring. These springs can be recognized by being cadmium plated. The end with the closed coil which is marked by red painting, must be installed next to the cylinder head.

7. The valve springs of the intake valves need not be replaced. On the intake side, the use of no. 7740 outer spring and no. 7741 inner spring is to be continued.

Carburetor Idling Adjustment

8. If the engine does not idle properly and cuts out in acrobatic maneuvers or normal glides, ascertain first that the carburetor is free of condensation or carburetor ice; that dirt is not blocking fuel jets or air bleeds, and that there are no intake manifold air leaks. Before making adjustments of the idle speed or idle mixture, the engine should be warmed up to its normal operating temperature. The idle mixture is adjusted by a small lever on the carburetor throttle barrel and the speed is adjusted by means of the throttle lever. The idle mixture adjustment is marked to show rich and lean positions and idle speed increased by turning the stop screw in and decreased by turning the stop screw out. Where carburetor heat is provided in the aircraft installation, sufficient heat to preclude possible icing should be used at all times when the ambient temperature is 50 degrees F or below, and also for part throttle or closed throttle conditions during any extended gliding operation. In fact, during glides, it is preferable to turn on full carburetor heat before closing your throttle in any outside air temperature. In setting the idling speed on the ground, full carburetor heat should be used when this setting is being accomplished in winter or at all times when carburetor heat is expected to be necessary.

9. It is desirable to set the idle mixture to give the best power at the idle speed required. To check the idle mixture setting, locate the idle mixture lever at its mid position, and allow the engine to idle until conditions are stabilized. Make a note of the idling speed, and then change the adjustment two or three notches to the rich side, and determine if the speed increases or decreases. Move the adjustment to the lean side, and repeat this operation. In this manner, the adjustment giving the maximum engine speed can be found. After the best mixture adjustment has been found, the idle speed adjustment should be changed to give proper idle speed of 400 to 500 R.P.M. If a change is required in the idle speed adjustment, the idle mixture adjustment should be rechecked. After the final adjustment has been made, the engine should be accelerated and decelerated a few times to make sure that the idle is stable and that the engine will not stall easily. Do not attempt to make the engine idle at too low a speed since this will result in poor running and frequent stalling. Improper idling mixture adjustment manifests itself by improper operation of the engine somewhere between 800 and 1200 R.P.M. at the change-over from the idling to the main jet system.

10. Another very excellent method for adjusting the idle mixture, if the plane is equipped with a manifold pressure gage, is to have one mechanic watch the manifold pressure gage, while another mechanic adjusts the idle mixture. The correct idle mixture adjustment will be the one giving the lowest manifold pressure reading.

11. It is important that an entry be made in your engine log book indicating the inspections were performed as outlined herein for future reference of the Civil Aeronautics Administration Inspector.

12. If you have sold your aircraft, please forward this bulletin to the new owner.

The Warner Aircraft Corp.

(Pg 16 blank
15