



INFORMATION BULLETIN

No. M 462 RF/39b

- REFERS TO:** Use of the PAL L 23.92 A screened spark plugs on the M 462 RF aircraft engines.
- REASON:** On basis of performed tests and applied Technical Conditions and Specifications No. TP 01-5173-78 of the spark plug type mentioned above, issued by the manufact. works, the L 23.92 A spark plugs have been recognized and specified as fully serviceable on the M 462 RF aircraft engines.
- MEASURES:** The service life of this type of spark plugs under usual service conditions of the M 462 RF aircraft engine is specified to 250 operating hours of the engine, whereby not later than after 150 operating hours it is necessary to carry out the servicing and checking operations according to the spark plug manufacturer's specification No. 415-9932-99 b (p. 2.1 and 2.2) attached to this bulletin.
- By using the type L 23.92 A of the spark plugs are in no way changed the obligatory periodical technical inspections and maintenance of the M 462 RF aircraft engine, specified in the manual "Technical Description and Operating Instructions of the M 462 RF Aircraft Engine".
- According to the decision of the State Civil Aviation Inspection is the Information Bulletin M 462-RF/33b and the use of spark plugs of the PAL L 23.92 type in aircraft operation cancelled.

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Prague, 28. 10. 1983.

I N S T R U C T I O N S

ON FITTING-IN, REMOVING, SERVICING, DUE ADJUSTING AND CHECKING
OF AIRCRAFT ENGINE SPARK PLUGS OF THE PAL L 23.92 A TYPE

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1 I N S T R U C T I O N O N F I T T I N G - I N A N D R E M O V I N G T H E S P A R K P L U G S

1.1 Due fitting the spark plugs in the aircraft engine

Take the spark plug out of its package and remove the protector off the spark plug thread. Then remove the preserving film and properly clean out of the spark plug threaded pin hole and off the spark plug insulator tip by washing the spark plug in some pure petrol bath. Dry up the spark plug, especially its orifice for connecting the high voltage supply cable, thoroughly by means of compressed air. The thread of spark plug sleeve is to be coated uniformly by a mixture of 20 per cent colloid graphite dissolved in heavy lub. oil by means of a brush. At this operation, however, be careful enough not to foul the spark gap of spark plug with graphite.

Screw the spark plug, provided with a packing ring, into the cylinder head. Retighten the spark plug cautiously by means of the specified socket torque spanner of 30 Nm max. torque which is not allowed to be exceeded. While screwing and retightening the spark plugs into the engine cylinder head, be cautious enough to avoid any straining the spark plug by additional torsional or bending stress, as otherwise the screw pin of spark plug could break off.

After having the spark plug inspected and cleaned thoroughly, put in and reconnect the respective ignition cable provided with the cable terminal. The union nut of the screening tube bend is first to be screwed in only by hand and then cautiously retightened by means of the serviceable torque spanner of about 15 Nm torque.

In any case it is allowable to screw in the engine cylinder head only a new spark plug or a spark plug thoroughly checked, tested and adjusted according to the instruction specified herein under the following paragraph 2.

Every spark plug is to be handled very cautiously, the spanner to be used is to be fully serviceable and no bending stress and no hammer

strokes nor impacts onto the spark plug nor onto the spanner are allowable. If any of the spark plugs falls down onto the ground, such a spark plug has to be rechecked, retested and readjusted according to the instruction specified herein under the point 2.22.

1.2 Operation

The function check on engine is to be executed every day by switching on and off the magnetoes.

1. Removing the spark plugs off the aircraft engine

The spark plugs are to be removed off the engine for the following purposes only:

- a) for the periodical examination of the external condition and due serviceability of spark plugs;
- b) for the obligatory engine overhauls as specified;
- c) in case of a failure or defect of engine operation.

In such cases as stated hereabove let the engine first cooled down, then screw off the cable screening tube bend, take out the ignition cable, put the serviceable socket spanner to the spark plug and loosen it by the max. allowable torque of 50 Nm. If necessary to apply a major torque exceeding 50 Nm, then would be necessary to recheck the spark plug acc. to the instruction specified under the point 2.22. Any auxiliary knocking onto the spanner is not allowed. The spark plugs removed off the engine cylinder head are to be put separately in suitable package and should be given over for checking and servicing operations.

2 INSTRUCTION ON DUE SERVICING, ADJUSTING AND CHECKING THE SPARK PLUGS

2.1 Servicing and adjusting the spark plugs removed out of the engine

The spark plugs removed from the engine acc. to instruction specified under the paragraph 1 are to be marked with the real number of operating hours worked off by the respective aircraft engine.

This marking is to be done on the surface of the spark plug screening jacket.

Then are the spark plugs to be selected and separated acc. to their appearance and service condition in two groups: no more serviceable spark plugs and still furtheron serviceable spark plugs, but necessitating some servicing.

Spark plugs held for no more serviceable are to be put out of operation in the following cases:

- a) if the spark plug electrodes are so excessively burnt that the min. breadth of the burnt oval of the middle electrode is minor than 2,7mm (the middle electrode owing to the bipolar outer electrode is getting burnt in the shape of oval section) or, if the thickness of both the poles of the spark plug electrode is minor than 0,8 mm;
- b) if the insulator is broken or split off (found out at the external examination) or if the dilatation joint between the central electrode and the insulator is completely filled by vitric sediments;
- c) if the spark plug pin thread is somehow damaged or deformed (this may be caused by improper dismounting the spark plug from the engine).
- d) if a smoked area on the spot of high voltage power connection to the spark plug is found.

The no more serviceable spark plugs are to be well-visibly red-marked as rejected ones and taken out of further service.

The surfaces of the other, still serviceable spark plugs are to be cleaned by means of a wiper soaked in petrol, by means of a brush soaked in petrol is to be washed the graphite coating off the thread and the screw pin of the spark plug is to be submerged in some petrol bath for about 10 to 15 minutes. In the petrol bath are to be cleaned also the packing rings. After taking the spark plugs out of cleaning bath blow them off by means of compressed air and dry them thoroughly.

The spark plugs, the insulator tip of which is somehow fouled by a carbon or slag deposit, have to be cleaned by sand-blasting. In such a case is the spark plug to be put into the sand-blasting device and the spark plug insulator tip is to be sand-blasted as long as necessary under the operating air pressure of 0,8 MPa, blasting sharp-edged quartz or corundum sand of 0.2 to 0.3 mm grain size onto the spot to be cleaned up. However, it is to say that too long sand-blast cleaning may cause a considerable loss of material of the electrodes.

After the sand-blasting operation is the sand stuck inside the spark plug to be removed out of the spark plug by slight knocking the hexagonal part of the spark plug against an elastic pad and finally by compressed air blowing, too. Then examine the spark plug by means of an inspection lamp and a magnifying glass whether there is no sand grain stuck between the insulator tip and the jacket or, between the middle electrode and the insulator of the spark plug. Then wash the spark plug thoroughly in some pure petrol bath and dry up by compressed air. At last are the spark plug electrodes to be properly adjusted as specified to the spark gap of $0,3 \pm 0,1$ mm. At this adjusting operation be cautious enough not to stress the spark plug middle electrode in any way by pressing on it nor by crowing or pinching it as the insulator tip could get damaged and such a spark plug could then cause a self-ignition.

The spark plugs properly cleaned up and adjusted as stated above are to be provided with packing rings and prepared to pass them to the fitting workshop for remounting them onto the engine.

2.2 Checking and testing the spark plugs removed out of the engine

The properly pretreated spark plugs before remounting them onto the engine have to be additionally checked and tested as follows:

- a) Check of proper adjustment of the spark plug electrodes;
- b) Test of due function and tightness of spark plugs;
- c) Inspection of external appearance and condition of spark plugs.

2.2.1 Check of due adjustment of the spark plug electrode

This spark gap adjustment of spark plug electrode is to be carried out by means of the serviceable wire gauge of $0,3 \pm 0,1$ mm. If necessary, the spark gap of spark plug electrodes has to be properly re-adjusted as specified.

2.2.2 Test of spark plug serviceability and tightness

This test is to be carried out by means of a serviceable testing device equipped with an air-pressure chamber with an inspecting hole to observe the spark gap, with high-voltage power supply with secondary voltage at least 15 kV maximum, and with a control parallel spark gap set up on 15 kV.

The spark plug to be tested should be fixed in the air-pressure chamber and on the bolt the high-voltage cable terminal connected. Into the air-pressure chamber is to be supplied pressure air of 1.1 to 3 MPa and simultaneously the high-voltage power is switched on. Through the inspecting hole is then to be inspected the sparking of the spark plug electrodes and the sparking of the control spark gap as well.

Due tightness of the spark plug is tested by means of a device where 10 pieces of spark plugs are fixed. Their untightness is found out by plunging the spark plugs into the liquid tank. Each escaping bubble of air equals to 1 cu.cm.

As faulty and unserviceable spark plugs are to be considered the spark plugs as stated here below:

- 1) if there does not appear any sparking of the spark plug electrodes up to the applied testing air pressure of 1.1 MPa;
- 2) if there does not appear any sparking of the spark plug electrodes, nor at the parallel spark gap of the testing device adjusted properly as specified, while applying a higher air pressure over 1.1 MPa;
- 3) if the leakage of the spark plug being tested exceeds the max. allowance of 10 cu. cm. per minute at the applied testing air pressure of 3 MPa as specified.

2.23 Inspection of external appearance and condition of spark plugs

A. At this inspection should be examined:

- a) the screw bolt of the spark plug jacket if it is not damaged or if there are no fissures or even cracks on its surface (examinations by means of a magnifying glass of a triple magnification);
- b) the spark plug insulator if it is not cracked, broken or split;
- c) the thread of the spark plug screening jacket if it is not anyhow damaged;
- d) the tip of spark plug insulator if it is properly clean after sand-blasting cleaning.

In some cases during service may appear a very hard slag coating on the spark plug insulator tip which cannot be entirely removed by the sand-blasting cleaning or the dilatation joint between the central electrode and the insulator is choked or the middle electrode is shifted in more than 0.3 mm under the face level of the outer electrodes. Such faulty spark plugs have to be rejected as they are unserviceable.

- e) the gap between the central electrode and the insulator as well as the space between the insulator tip and the jacket of spark plug if there are not any resting sand grains and, if there remained any ones, they have to be all additionally removed.

- B. The spark plugs found at this inspection and examination as defective - with the exception of the trouble stated above under the point e), which can be easily recleaned - have to be visibly red-marked and refused as entirely unserviceable.

The packing washers can be used not only once, but many times. Rejected as unserviceable should be only those ones, which are compressed by more than a third of their original thickness. The spark plugs being considered at the examination as fully serviceable for further engine operation are to be put in protective packages and thus duly prepared for refitting in the engine.

The checker should then make an entry on the test and inspection of the spark plugs examined in the engine log book, wherein should be stated the series No. of the respective engine, number of covered operating hours of the engine and true result of the test and inspection just undertaken (i.e. number of rejected, no more serviceable spark plugs, after how many operating hours and from which engine cylinders they were rejected, and finally, also the reason of their putting out of further operation).

3 LIST OF RECOMMENDED TOOLS AND OTHER APPLIANCES

1. The torque spanner
2. Spark plug electrode gap gauge $0,3^{+0,1}$ mm dia.
3. Spark plug testing device of the JT 240 type or a set of testing devices for spark plug functional check under pressure incl. the high-voltage supply Drwg.-No. 0359.20 and tightness testing device Drwg.-No. 0359.01.