

**TECHNICAL NOTE NO. 26**

Date: December 14, 2016

Object

Valve adjustment and control of the rocker arm geometry of engines with and without hydraulic valve clearance compensation (hydraulic tappet).

Affected devices

Engine S1800 (), LBA Device No. 4590
Engine S1800 UL

Engine S2100 (), LBA Device No. 4608
Engine S2100 UL
Motor S2200 UL
Motor S2400UL

Engine S2500 (), LBA Device No. 4580
Engine S2500 UL

Cause

Improper valve adjustment, in engines with hydraulic valve clearance compensation (hydraulic tappets), has led to engine malfunctions in the past.

In the case of a valve train with hydraulic valve clearance compensation (hydraulic tappet), repeated adjustment of the valves at intervals is unnecessary in normal operation. Only after dismantling work in the area of the valve timing (dismantling of the cylinder head, the rocker arm shaft, the tappets and hydraulic tappets) must a "**basic adjustment**" of the valves, as described below, be carried out.

In the case of a valve train with mechanical tappets (without hydraulic tappets), a valve clearance is required, which is set to 0.2 – 0.25 mm.

If, in ignorance of the presence of hydraulic tappets, the valve train is adjusted with the aforementioned valve clearance, it may happen that there is too little space between the Rotocap and the rocker arm, as in this case the penetration depth of the valve adjustment screw into the valve train is too small.

When the valve is pressed, the rocker arm can then touch the Rotocap. This can cause the valve wedges to loosen and, in extreme cases, jump out of their seat. The valve is then no longer held and sucked into the cylinder, which inevitably results in capital engine damage.

Therefore, check your engine's owner's manual in advance to see if your engine is equipped with hydraulic lifters. If in doubt, ask the manufacturer.



Urgency of the measures:

For motors with hydraulic tappets:

Measures 1.1 to 1.4 within the next 20 flight hours. Measure 1.5. in all further 100h controls.

For engines without hydraulic tappets:

Measure 2.1 at the next due 50h inspection as well as in all further 100h inspections.

Measures and valve adjustment

1. Motors with hydraulic tappet:

Make sure the ignition is off.

1.1. A basic adjustment of the valve train must be carried out as follows:

1.2. Carefully open the cylinder head cover spring bracket without damaging the tappet tubes.

1.3. Locate the top dead center of the cylinder to be adjusted by turning the propeller. The valve train is always adjusted when the respective cylinder is on TDC in the working stroke.

1.4. Loosen the lock nut of the respective valve you want to adjust and unscrew the valve adjustment screw until it no longer touches the valve stem and there is play between the valve adjustment screw and the valve stem.
Then screw the valve adjustment screw back in just enough until it is in contact with the valve stem. From this position, screw the valve adjustment screw 1-2 turns to the right. This is used to preload the hydraulic tappet.

1.5 When the valve is fully depressed, the specifications in accordance with TM 25 must be checked. There must be at least 1mm of clearance between rocker arm and Rotocap (see Picture).
If this minimum clearance does not occur, contact should be made with the company Sauer Flugmotorenbau to remedy the problem, where further instructions can be requested.
Other valves are adjusted in the same way.

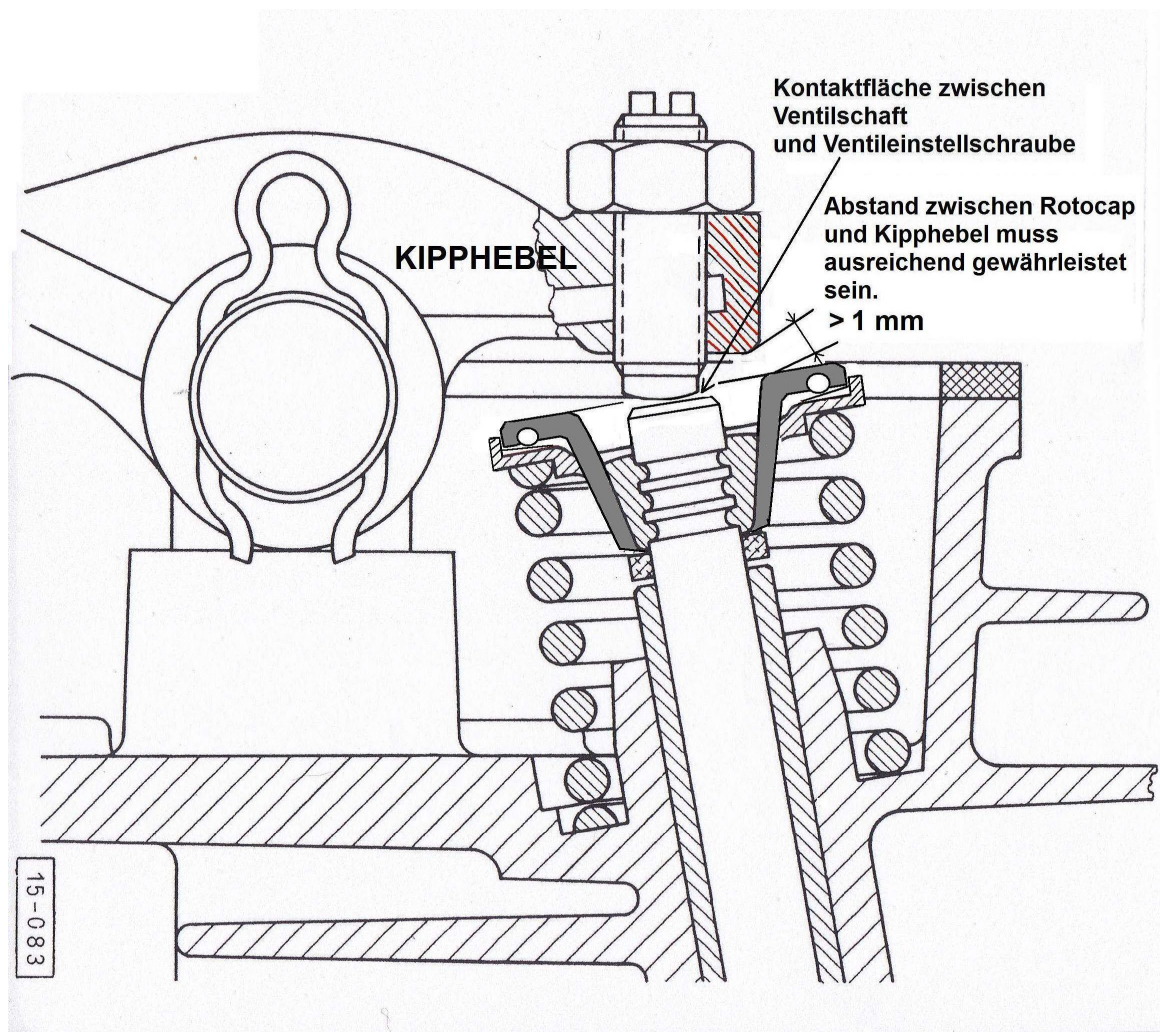
Note: We would like to point out that after repair work involving the valve train, hydraulic tappets must first "settle". This means that the engine must be operated for about 10 to 15 minutes after the repair is complete. After that, the basic setting must be repeated.

2. Engines without hydraulic tappets:

Make sure the ignition is off. Carry out the measures

according to 1.1., 1.2. and 1.3.

2.1. For motors with mechanical tappets, a valve clearance of 0.2 - 0.25 mm is required. This valve clearance must be checked and, if necessary, adjusted.
To do this, the motor must be rotated by hand and the rocker arm geometry must be checked. With the valve half pressed, the valve adjustment screw should be perpendicular to the valve stem. When the valve is fully depressed, there must be at least 1 mm of clearance between the Rotocap and the rocker arm. (See TM25).
At no time must a rocker arm touch the Rotocap.



Sauer Flugmotorenbau GmbH

German Federal

Aviation Office Martin Manthey

**TECHNICAL NOTE NO. 25**

Date: December 14, 2016

Object

Control of the rocker arm geometry and the contact surfaces between the valve stem and the valve adjustment screw.

Affected devices

Engine S1800 (), LBA Device No.

4590 Motor S2100 (), LBA Device

No. 4608 Engine S2500 (), LBA

Device No. 4580

Cause

In the past, the valve stem was occasionally damaged due to insufficient lubrication at the contact surfaces between the valve stem and the valve adjustment screw.

Increased wear can occur on the highly stressed contact surfaces between the valve stem and the valve adjustment screw if the lubricating film breaks off as a result of direct contact between the valve adjustment screw and the valve stem.

Over time, this increases the penetration depth of the rocker arm into the valve train to such an extent that, in extreme cases, a rocker arm begins to act on a Rotocap. As wear progresses, this can lead to the loss of the safety wedges of a valve and thus to major engine damage. For this reason, the distance between the rocker arm and the Rotocap must be visually inspected at regular intervals.

The distance between the rocker arm and the Rotocap must be at least **1 mm** or greater when the valve is fully pressed.

Urgency

Within the next 20 hours of operation. After that, as part of every 100h check.

Measures

1. Make sure the ignition is off.
2. Remove the valve cover. Do not damage the tappet protection tubes when levering off the valve cover clips.
3. Crank the engine by hand on the propeller.
4. Visual inspection of the contact surfaces between the valve adjustment screw and the valve stem for damage caused by material removal.



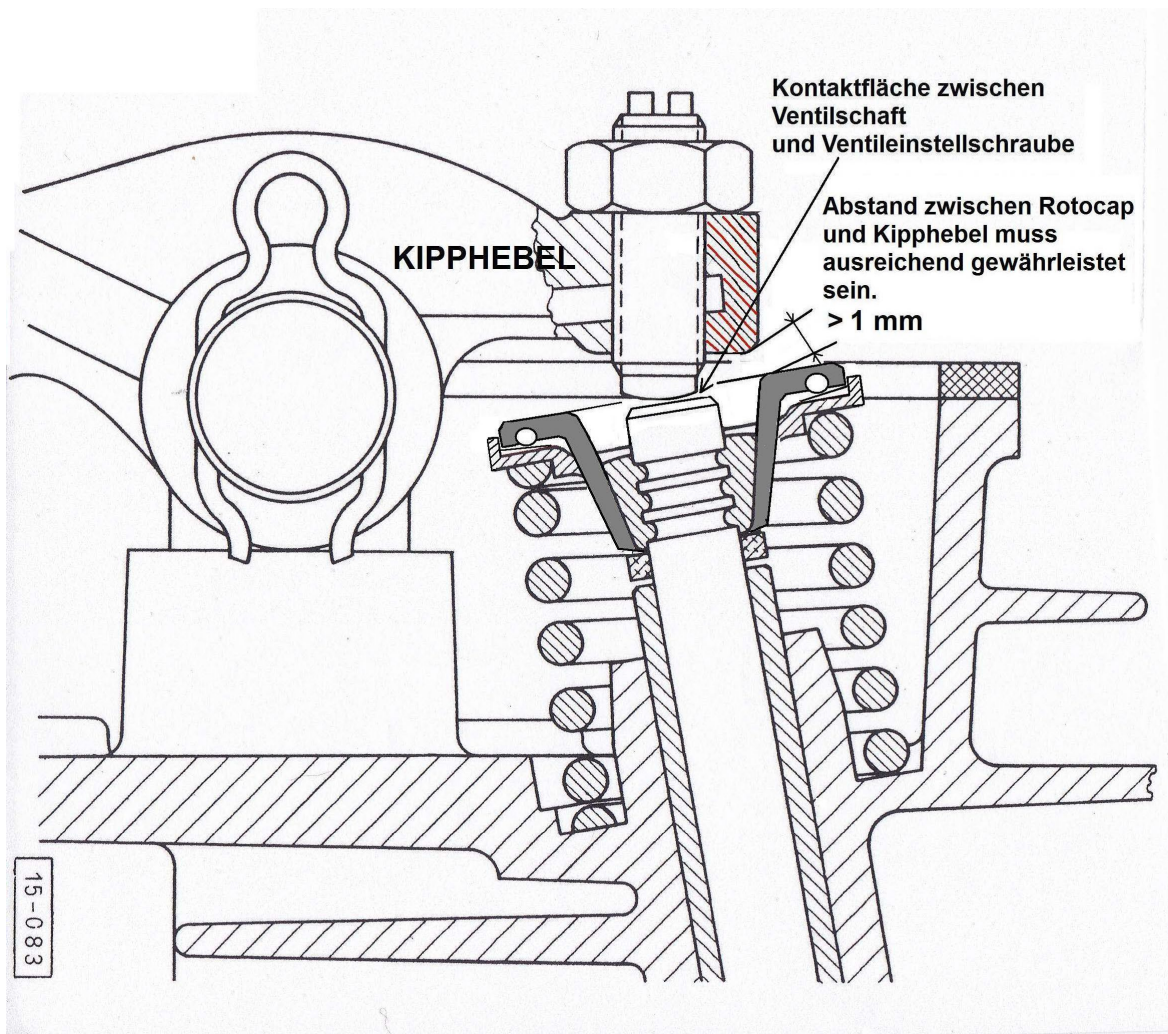
5. Spin the engine by hand and check the rocker arm geometry.

With the valve half-pressed, the valve adjustment screw should be perpendicular to the valve stem.

When the valve is fully depressed, there must be at least 1 mm of clearance between the Rotocap and the rocker arm.

If there is less than 1mm of clearance between the rotocap and the valve stem and or the contact surfaces between the valve adjustment screw and the valve stem have run in in such a way that there is a suspicion of insufficient lubrication, the company Sauer Flugmotorenbau GmbH must be informed.

The corresponding information on the repair will be provided by the company Sauer Flugmotorenbau GmbH.



Sauer Flugmotorenbau GmbH

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