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| CZECH SPORT AIRCRAFT | **SAFETY ALERT / SAFETY DIRECTIVE** | Czech Sport Aircraft a.s.<br>Na Záhonech 212<br>686 04 Kunovice<br>Czech Republic<br>office@czechsportaircraft.com |
| No. SA-SC-007 | | Rev.: - |
| Date: 2017-11-29 | | |
| Page: 1 of 9 | | Date: - |

| | |
|---|---|
| **MODEL AFFECTED:** | SportCruiser |
| **SUBJECT:** | Inspection and / or replacement of the valve push-rod-assy. for ROTAX® Engine Type 912 S2 and 912 ULS2. |
| **AIRCRAFT AFFECTED:** | 1. Aircraft serial numbers C0552, C0555, C0556, C0576, C0577, C0578, C0579, C0580, C0581, C0582, C0583, C0584, C0585, C0586, C0587, C0588, C0591, C0592, C0593, C0594, C0595, C0596, C0597, C0598, C0599, C0600, C0608, C0609, C0610, C0611, C0612, C0613, C0614, C0615<br>2. All other aircraft the engine of which has been equipped with valve push-rod assy. part no.854861 during the engine repair, maintenance or general overhaul within the period as of 01 May 2016 till 30 November 2017, inclusive.<br>3. All other aircraft with any of the following engine S/N installed::<br>- from S/N 6 772 119 up to S/N 6 772 185 inclusive<br>- from S/N 9 580 001 up to S/N 9 580 262 inclusive<br>- from S/N 6 785 892 up to S/N 6 786 198 inclusive<br>- from S/N 6 786 501 up to S/N 6 787 000 inclusive<br>- from S/N 9 569 001 up to S/N 9 569 690 inclusive<br>- from S/N 9 569 693 up to S/N 9 569 702 inclusive<br>- S/N 9 569 823 |
| **COMPLIANCE:** | • Carry out inspection of the engine on the aircraft listed in section "AIRCRAFT AFFECTED" above, according to the instructions stipulated in section 13 below upon the next scheduled maintenance event or within the next 25 hours of operation, whatever occurs earlier, but in any case till 30 April 2018, at the latest.<br>• At rough engine running, or unusual engine operating behaviour carry out this Safety Alert before the next flight. |

## 1. DESCRIPTION:

This Safety Alert contains instructions for inspection and / or replacement of the valve push-rod-assy., rocker arm left/right for ROTAX® Engine Type 912 (Series). Power loss and engine RPM drop have been reported on Rotax 912 engines in service. It has been determined that, due to a quality control deficiency in the manufacturing process of certain push-rod assemblies, manufactured between May 01, 2016 and October 02, 2017 inclusive, partial wear on the rocker arm ball socket may occur, which may lead to malfunction of the valve train.

## 2. APPROVAL:

The corrective action is mandatory and is required by the ROTAX® company. (See the ROTAX® SB-912-070 / SB-912-070UL, SB-912-070 R1, issued 12 October 2017).

## 3. AUTHORISATION TO PERFORM:

ROTAX® – Airworthiness representatives

ROTAX® – Authorised Distributors or their independent Service Centers

Persons approved by the respective Aviation Authority

Persons with approved qualifications for the corresponding engine types. Only authorized persons (iRMT, Level Heavy Maintenance) are entitled to carry out this work.

**NOTE:** A list of all ROTAX® Authorised Distributors or their independent Service Centers is provided on www.FLYROTAX.com.

All work has to be performed in accordance with the relevant Maintenance Manual.

## 4. REASON:

The wear on the rocker arm ball, if not detected and corrected, might lead to a rocker arm cracking / fracture in consequence may lead to a malfunction of the valve train, rough engine operation and loss of power, possibly resulting in a forced landing, with consequent damage to the airplane and injury to occupants.

## 5. MANPOWER:

Max. 1 hour

## 6. SPECIAL TOOLS:

Common tools for maintenance + see the point 12. below.

## 7. WEIGHT AND BALANCE:

Not affected.

## 8. ELECTRICAL LOAD DATA:

Not affected.

## 9. REFERENCES:

ROTAX® SB-912-070 / SB-912-070UL, SB-912-070 R1

ROTAX® SI-912-009, latest revision

SportCruiser / PiperSport Airplane Maintenance Manual SC-AMM-1-0-00, Rev.10, dated 18 October 2017

In addition to this technical information refer to current issue of

- all relevant ROTAX® Service Instructions (IS)
- ROTAX® Maintenance Manual Heavy (MMH)

## 10. PUBLICATIONS AFFECTED:

N/A

## 11. MATERIAL AND COST:

### 11.1 Material – cost and availability

Price and availability of parts will be provided on request by ROTAX® Authorised distributors or their independent Service Centres.

### 11.2 ROTAX Company support information

Shipping costs, downtime costs, loss of income, telephone costs etc. or costs of conversion to other engine versions or additional work, as for instance simultaneous engine overhauls are not covered in this scope and will not be borne or reimbursed by ROTAX®

### 11.3 Material requirement per engine

Parts requirement: Order parts as required for the relevant job task to be determined in section 13.

| Fig. no. | | part no. | Qty/engine | Description | Application |
|---|---|---|---|---|---|
| 2 | required parts for inspection | 840887 | 4 | Allen screw M6x30 10.9 | valve cover |
| 2 | | 927941 | 4 | Washer 6.0/12/1 | valve cover |
| 2 | | 881920 | 1 Set | O-Ring set | valve cover |
| 1 | required parts for replacement | 854861* | as required | Valve push-rod assy. | cylinder head |
| 2 | | 854383 | as required | Rocker arm left | cylinder head |
| 2 | | 854393 | as required | Rocker arm right | cylinder head |

* or relevant part as per supersedure history

### 11.4 Interchangeability of parts:

- all affected parts cannot further be used and must be returned F.O.B to ROTAX® Authorised distributors or their independent Service Centres.
- further sale, use or shipment of all valve push-rods no. 854861 produced in the affected time period (as of May 01, 2016 until October 02, 2017), in stores (e.g. replacement parts) are also affected and the parts must undergo a visual inspection of valve push-rods as per section. 3.1.2 and if found not OK must be returned F.O.B. to ROTAX® Authorized distributors or their independent Service Centres.

## 12. Special tooling / lubricant adhesives / sealing compound / price availability

Price and availability will be provided on request by ROTAX® Authorised distributors or their independent Service Centres.

| Description | Qty/engine | Part no. | Application |
|---|---|---|---|
| Valve spring loading jig | 1* | 877387** | valve spring |
| KLÜBER ISOFLEX TOPAS NB 5051 | as required | 898351*** | rocker arm bearing |

*) Only needed if replacement task is required.

**) or equivalent e.g. valve spring mounting device assy. part no. 877385

***) or equivalent.

**NOTE:** If using these special tools observe the manufacturers specifications.

## 13. ACCOMPLISHMENT INSTRUCTIONS

**13.1 Move the aircraft to a suitable place to perform the work.**

**13.2 Remove the upper and bottom engine cowling, see the SC-AMM-1-0-00, the latest revision.**

**13.3 Disconnect the battery terminals.**

**13.4 Removing valve covers**

See Fig.2.

| Step | Procedure |
|---|---|
| 1 | Loosen Allen screw (1) M6x30 with washer (2) from valve cover (3), and remove it together with large and small O-rings (4) and (5). |

**13.5 Visual inspection of valve push-rods**

Perform visual inspection of all push-rod ball sockets on all cylinder.

Check for color. See Fig.1.

| Color | Evaluation |
|---|---|
| Silver surface | Valve push-rod is OK. No further action required for this valve push-rod. |
| Black surface | Valve push-rod is NOT OK.<br>See section. 13.6) Replacement of affected parts. |

**13.6 Replacement of affected parts on affected cylinder positions (only in case visual inspection is NOT passed OK)**

See Fig.2 and Fig.3.

On valve trains with valve push-rods found NOT OK the following steps need to be performed:

**NOTE:**On standard applications, the replacement of the push rods and rocker arms can be carried out with engine installed in aircraft.

| Step | Procedure |
|---|---|
| 1 | Remove the spark plug connector and the four top spark plugs. |

**NOTE:**Prevent entering of foreign substance through spark plug hole.

| Step | Procedure |
|---|---|
| 2 | Turn crankshaft so that the respective piston is exactly on ignition top dead center.<br>NOTE: Only when you have an Criterion B) Spare parts affected engine and only if engine is equiped with collar cap nuts M8 wrench size 13: Loosen the external collar cap nut (6) for easier disassembling the rocker arm shaft. |

**NOTE:** Do not loosen the collar nuts M8. There is no reason to remove or loosing the M8 collar nuts the head stud may come loose requiring re-installation as per current ROTAX® Maintenance Manual. In the event that in loosening collar nuts M8, the stud becomes loose, retighten the stud to 3 Nm (26 in.lb).

| Step | Procedure |
|---|---|
| 3 | Attach the support plate (12) to the valve spring loading jig part no. 877387 (7) with 2 hex. screws (13) M6x16 at the attachment points (14) on the cylinder heads. |
| 4 | Put adapters (15) on the valve spring loading jig. |
| 5 | Attach the valve spring loading jig on cylinder head and support plate with 2 Allen screws (8) M6x70 and depress both valves with 3 turns. |

**WARNING:** When attaching the loading jig, take care to depress the valve with the valve spring simultaneously. Push the valve stem if need be, otherwise there is risk that the valve cotters will displace or may drop out.

| Step | Procedure |
|---|---|
| 6 | This will relieve the pressure from both hydraulic tappets. Now the rocker arm shaft (9) may be easily pulled out. Lift out both rocker arms (10) and (11). |
| 7 | Replace only affected parts as per section 11.3). See also Fig. 3. |
| 8 | Apply KLÜBER ISOFLEX TOPAS NB 5051 (16) on both push-rod ball sockets and contact areas of rocker arm and slide push-rod into the oil return tube (20). |
| 9 | Check bushing and rocker arm shaft according to latest Maintenance Manual Heavy. |
| 10 | Put oil on the rocker arm bushing. |
| 11 | Place rocker arm left (10) and rocker arm right (11) in cylinder head, apply KLÜBER ISOFLEX TOPAS NB 5051 (16) on rocker arm shaft (9) and insert it into its bearing support. |
| 12 | Loosen valve spring loading jig and support plate. |
| 13 | When removing the valve spring loading jig , make sure the adapter rings (15) do not jam on the valve spring retainer. |
| 14 | NOTE: Only when you have an Criterion B) Spare parts affected engine and only if engine is equiped with collar cap nuts M8 wrench size 13:<br>Mount collar cap nut (6) according to latest Maintenance Manual Heavy or SI-912-025/SI-914-026/SI-912 i-010. |
| 15 | Lubricate all moving parts in the rocker arm space with engine oil or equivalent. |

### 13.7 Install valve cover

See Fig.2.

| Step | Procedure |
|---|---|
| 1 | Clean the sealing surface of cylinder head and valve cover with a suitable lint-free cloth or equivalent. |
| 2 | Insert new O-ring (4) 105x2.5 and O-ring (5) 6.4x1.8 into the valve cover (3). |
| 3 | Fit valve cover. |

**NOTE:** Between the valve covers a gap of min.0,1 mm (.004 in.) must remain. The covers must not touch each other.

| Step | Procedure |
|---|---|
| 4 | Tighten the new Allen screw (1) M6x30 with washer (2) to 10 Nm (89 in.lb). |

**WARNING:** Carefully inspect the length of the valve cover screw. Inspect whether thread is damaged. If the screw is loose or the valve cover leaking, the oil will not return into the oil tank by "blow-by gas" and the oil system will not properly function. Improper installation of the valve cover could lead to loss of crankcase pressure.

| Step | Procedure |
|---|---|
| 5 | Refit the wiring and top spark plugs (17) and tighten.<br>- If genuine ROTAX® spark plugs installed. Tighten the spark plugs to 16 Nm (142 in. lb.) on a cold engine.<br>- If still old spark plug version NGK used tighten to 20 Nm (177 in.lb) or change all spark plugs to genuine ROTAX® spark plugs according to SI-912 i-013/SI-912-027/ SI-914-028.<br>Install spark plug connector according to a marking sleeve. |
| 6 | Repeat the procedure on the remaining 3 cylinder heads. |
| 7 | Tighten the new Allen screw (1) M6x30 with washer (2) to 10 Nm (89 in.lb). |

**13.8 Connect the battery terminals.**

**13.9 Install the bottom and upper engine cowling on the airplane - see the SC-AMM-1-0-00, the latest revision, and restore the airplane to original operating configuration.**

**13.10 Test run**

Conduct test run. See chapter 12-20-00 of the ROTAX® Maintenance Manual Line for the respective engine type.

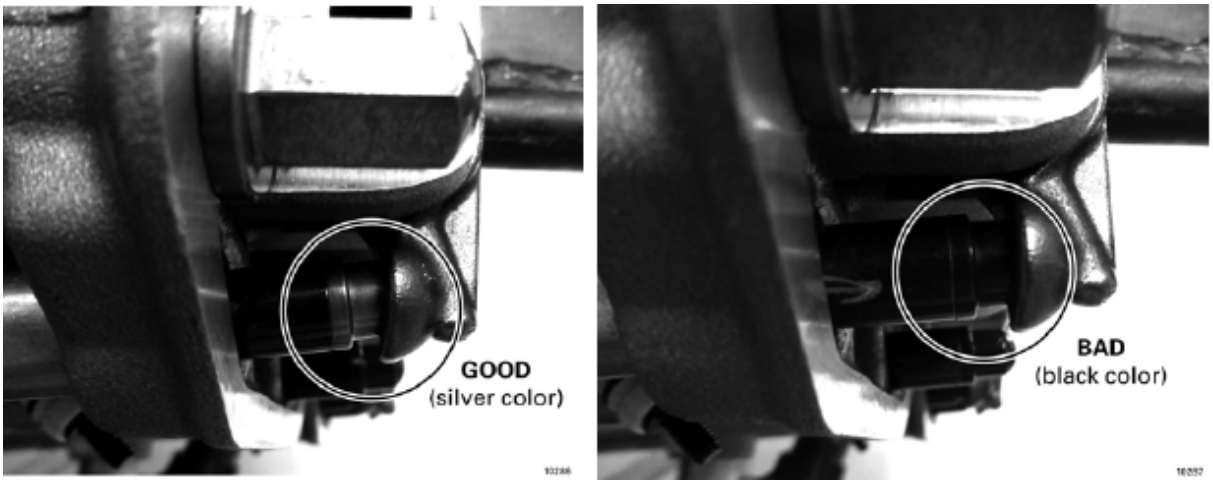
**NOTE:** These instructions (section 13) have to be followed in accordance with deadlines specified in section "COMPLIANCE" in the title sheet above.

**13.11 Complete aircraft records to reflect compliance with this Safety Alert.**

**NOTE:** If the aircraft is not affected by this Safety Alert, enter the following text into the aircraft logbook: "The SA-SC-007 applicability has been checked with the result: not applicable".

## 14. Appendix

The following drawings should convey additional information:




Comparison of spare parts:

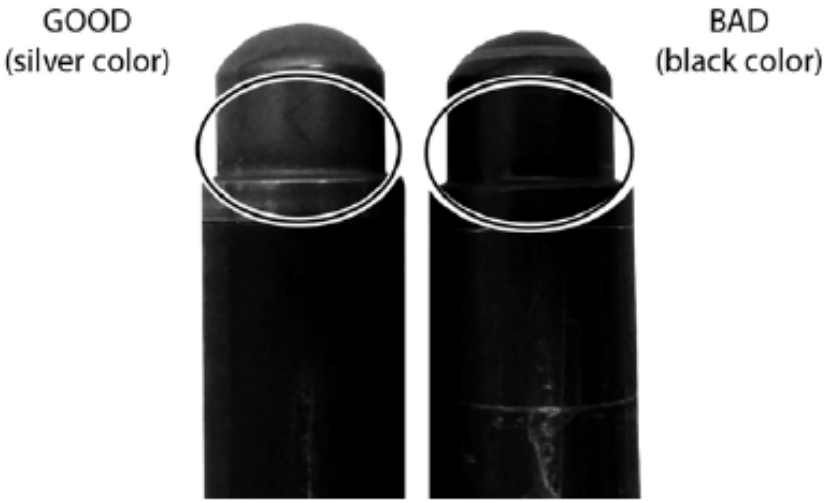



Fig.1 – Visual inspection

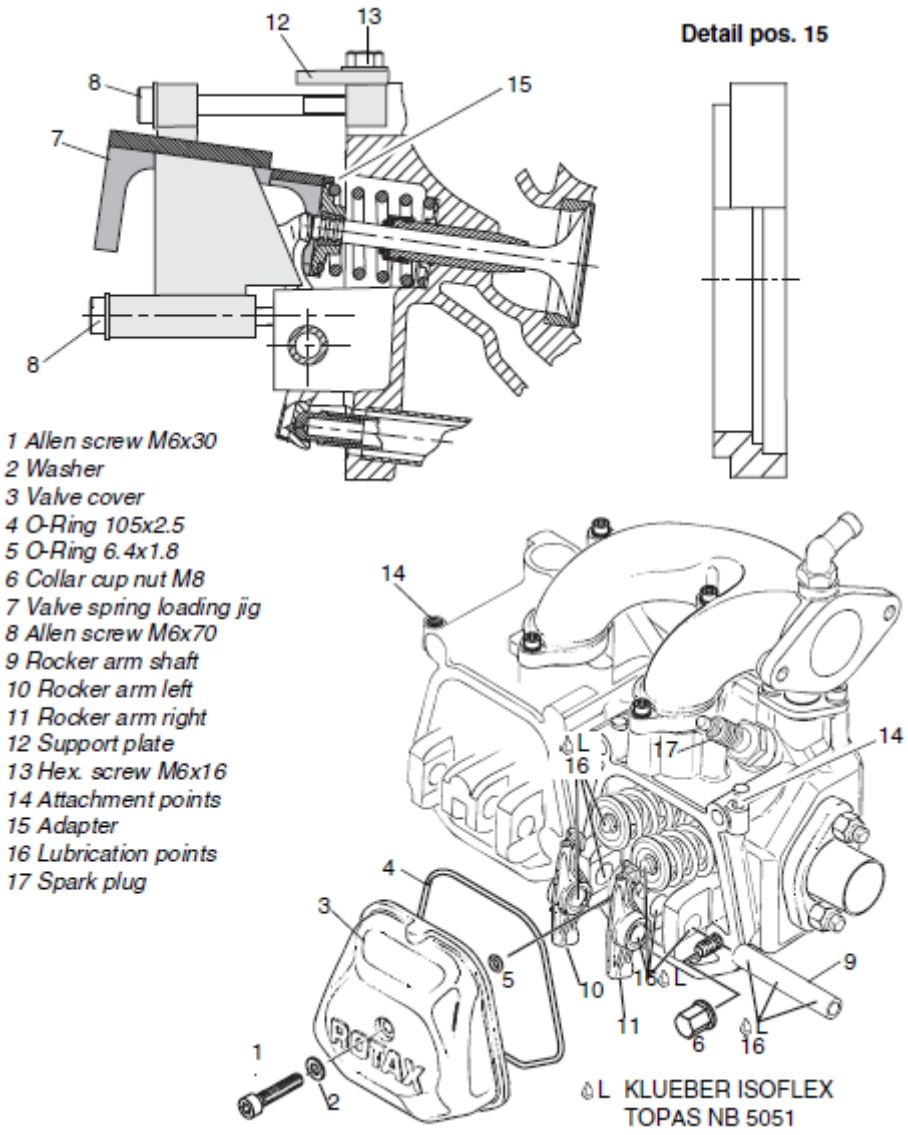

12
13
8
15
7
8
Detail pos. 15
1 Allen screw M6x30
2 Washer
3 Valve cover
4 O-Ring 105x2.5
5 O-Ring 6.4x1.8
6 Collar cup nut M8
7 Valve spring loading jig
8 Allen screw M6x70
9 Rocker arm shaft
10 Rocker arm left
11 Rocker arm right
12 Support plate
13 Hex. screw M6x16
14 Attachment points
15 Adapter
16 Lubrication points
17 Spark plug
14
L
16
17
14
4
3
5
10
15
L
9
11
6
L
16
1
2
L KLUEBER ISOFLEX
TOPAS NB 5051

Fig.2

*18 Rocker arm ball joint*
*19 Lubrication bore*
*20 Oil return tube*

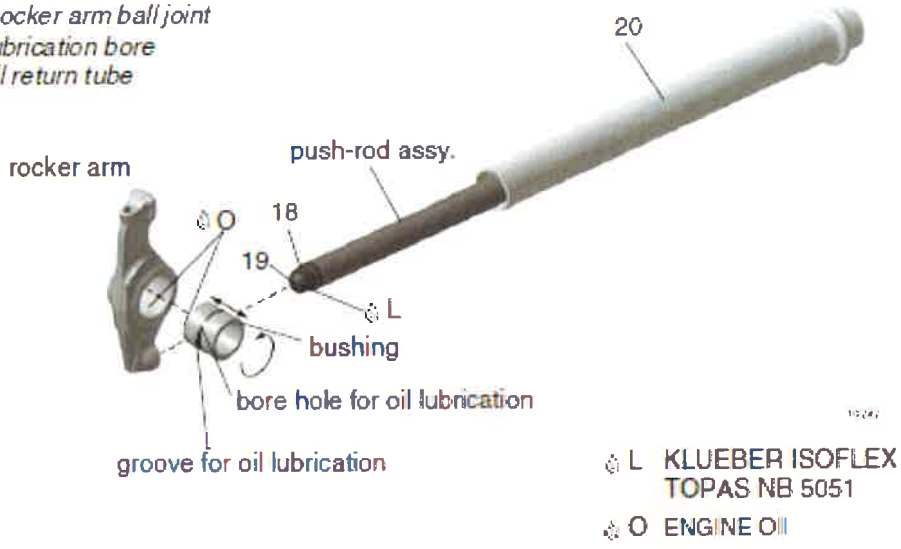



*Fig. 3*

NOTE: The illustrations in this document show the typical construction. They may not represent full detail or the exact shape of the parts which have the same or similar function.

Exploded views are **not technical drawings** and are for reference only. For specific detail, refer to the current documents of the respective engine type.

**APPROVAL:**

This Safety Alert has been approved by:

| **Title** | Head of the Design Organisation | Airworthiness Manager |
|---|---|---|
| **Name** | Jiří Konečný | Miroslav Koukal |
| **Signature** | | |