VIRGINIA FLIGHT SCHOOL SAFETY ARTICLE – NO 02/09

INCIDENT INVESTIGATION AT VFS

INTRODUCTION

An example of a reported occurrence is going to used to demonstrate the investigative and interventative actions taken by the Safety Section at VFS in mitigation of threats.

SYNOPSIS

After take of and during climb out engine started slight roughness at 800'. On downwind engine ran very rough and lost 400 – 500 RPM

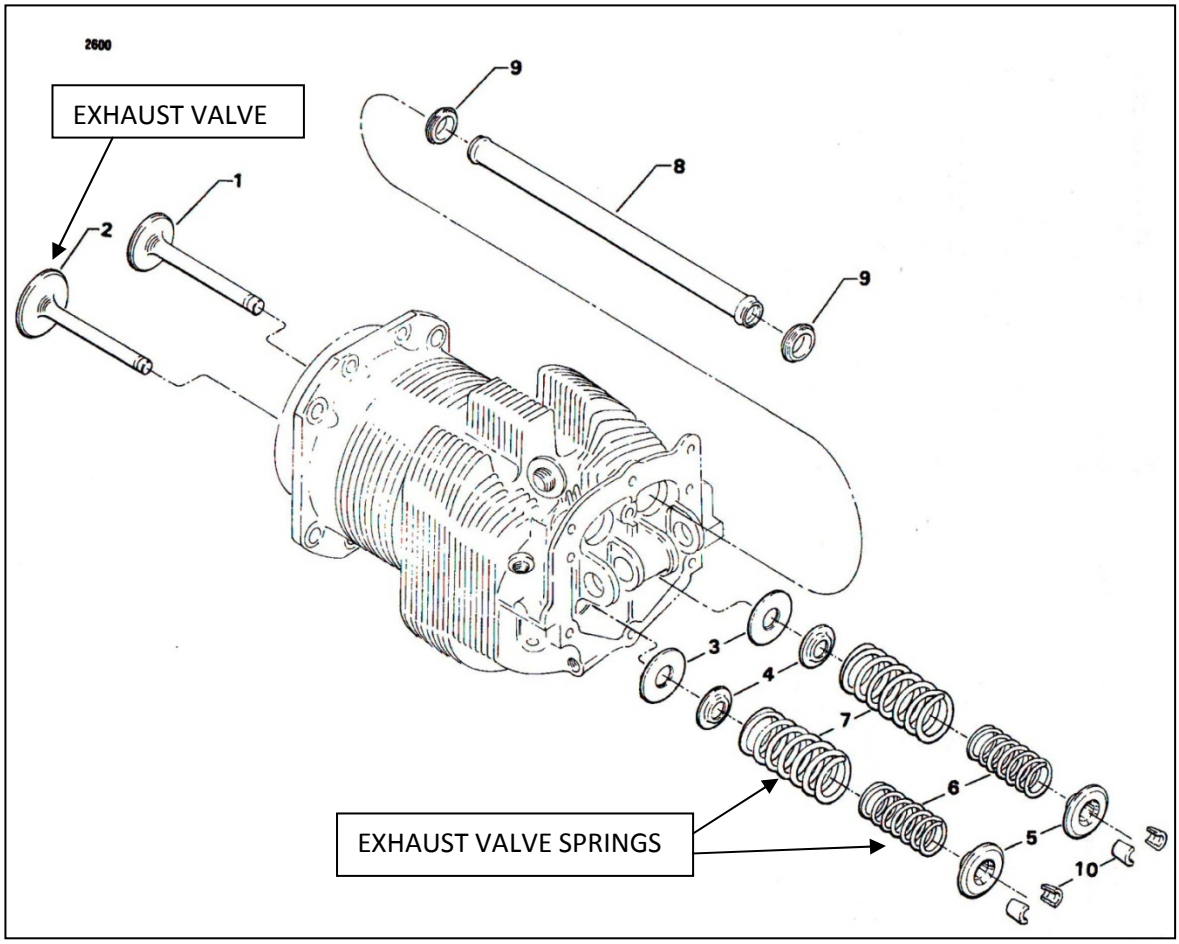
ADDITIONAL INFORMATION

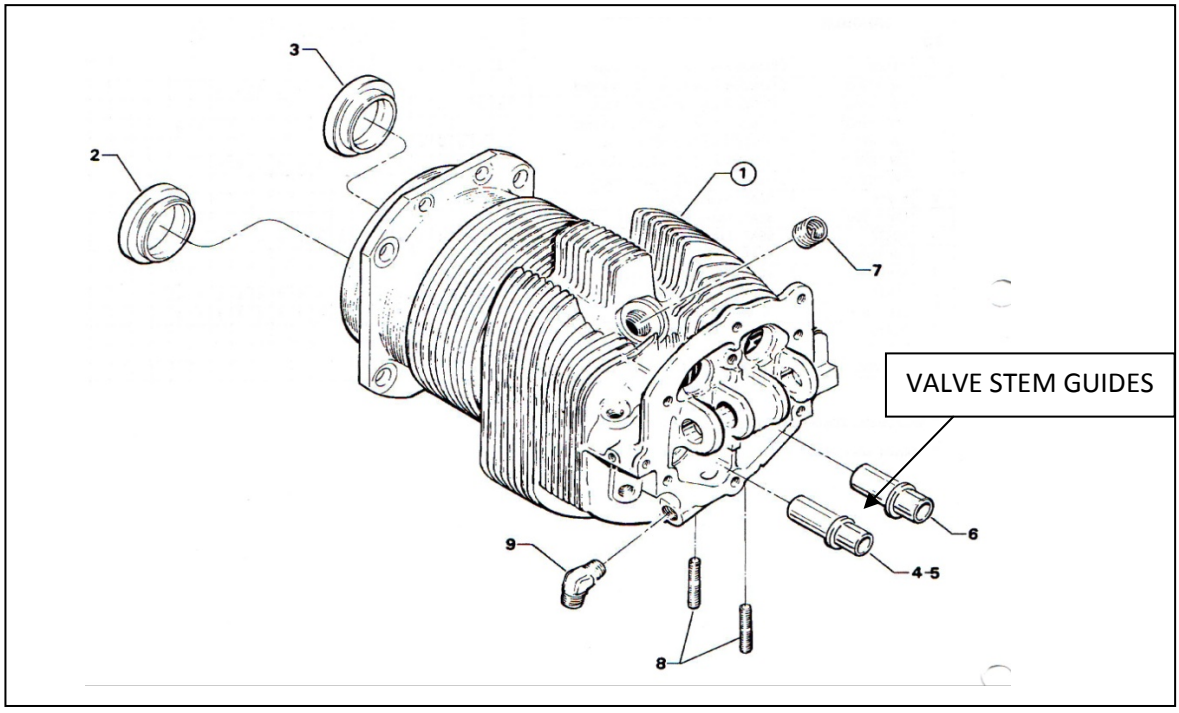
- The aircraft was snagged a few days prior to the incident for the same occurrence – rough running.
- The AMO inspected the aircraft, ran the engine throughout it's operating range and found no "roughness". Aircraft returned to service.

AMO ACTIONS AFTER 2ND SNAGGING:

- Plugs checked for fouling – no fouling.
- Magneto timing checked – correct.
- Induction system checked – no problem.
- AME discusses problem with FSO VFS. Propose checking for sticking valve as suspected by experienced pilot who snagged the aircraft.
- AME isolates cylinder with faulty exhaust valve.
- Cylinder removed. Exhaust valve springs found to have "collapsed" i.e lost their tension.
- Situation caused "valve bounce" which caused excessive valve guide and valve stem wear.

The diagramme on the following page illustrates the issue


2600
EXHAUST VALVE
EXHAUST VALVE SPRINGS
1
2
3
4
5
6
7
8
9
10


VALVE STEM GUIDES
1
2
3
4-5
6
7
8
9

RECTIFICATION ACTIONS

Cylinder head being overhauled.

FACTORS

Uncommon cylinder head with 3 valve springs – spares not available. Would have to convert all cylinder heads back to 2 valve spring type - cost.

FAULTY/STUCK VALVE NOTES

A stuck valve typically occurs when the engine is first started and is often identified by an intermittent hesitation, or miss, in engine speed.

In flight symptoms reported by pilots include slight roughness to severe roughness and loss of engine power (RPM).

Environmental influences that create valve sticking are: high temperatures, dirty oil, high lead content fuels, hot engine shut-downs, and poor engine baffling.

CONSEQUENCES

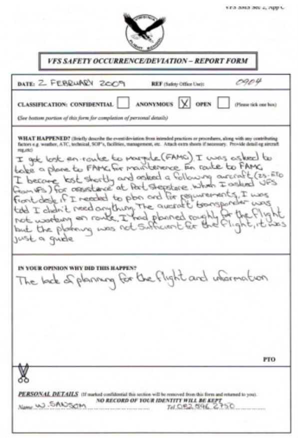
Warning! At the first signs of valve sticking ground the airplane.

Valve sticking can cause immediate and catastrophic engine failure. If valve spring pressure is not sufficient to close the valve, the valve train unloads. Aircraft engine damage does not always occur when the valve sticks, but the longer the engine operates in this condition, the greater the chances are that some damage will occur.

PREVENTATIVE MEASURES

Pay particular attention to the oil change intervals, baffle condition, and operating techniques.

Fill in occurrence reports! The reports get actioned and preventative actions taken which could save your life!


VFS SAFETY OCCURRENCE/DEVIATION – REPORT FORM

DATE: 2 FEBRUARY 2009 REF (Safety Office Use): 0904

CLASSIFICATION: CONFIDENTIAL ☐ ANONYMOUS ☒ OPEN ☐ (Please tick one box)

(See bottom portion of this form for completion of personal details)

WHAT HAPPENED? (Briefly describe the event/deviation from intended practices or procedures, along with any contributing factors e.g. weather, ATC, technical, SOP's, facilities, management, etc. Attach extra sheets if necessary. Provide detail eg aircraft reg,etc)

I got lost en-route to margate (FAMG). I was asked to take a plane to FAMG for maintenence. En route to FAMG I became lost shortly and asked a following aircraft (ZS-ETO from VFS) for assistance at Port Shepstone. When I asked VFS front desk if I needed to plan and for requirements, I was told I didn't need anything. The aircraft transponder was not working en route. I had planned roughly for the flight but the planning was not sufficient for the flight, it was just a guide

IN YOUR OPINION WHY DID THIS HAPPEN?

The lack of planning for the flight and information

PTO

PERSONAL DETAILS (If marked confidential this section will be removed from this form and returned to you)

NO RECORD OF YOUR IDENTITY WILL BE KEPT

Name: W. SANSOM Tel: 082 896 2750