

VIBRATION ON ROTAX 582 ENGINES

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THE RECENT ARTICLE ON FAILURES OF THE OIL INJECTION RESERVOIR BRACKET ON ROTAX 582 ENGINES HAS HIGHLIGHTED THE NEED FOR OWNERS TO ATTEMPT TO MINIMISE UNDUE VIBRATION ON THEIR AIRCRAFT. REGARDLESS OF THE RESULTS OF THIS INVESTIGATION, THERE IS LITTLE DOUBT THAT ANY UNDUE VIBRATION WILL BE A SIGNIFICANT FACTOR IN ANY SUCH FAILURE.

The most common causes of undue vibration are propeller imbalance, carburettor synchronisation and too low an idle speed.

Vibration caused by the propeller will be evident throughout the power range of the engine, although the severity may fluctuate with the power setting. In order to check the balance of the propeller you will require a BuzzMaster Prop Balancer or similar. If the propeller is found to be out of balance, then the action required will depend on the propeller type. The aircraft and or propeller manufacturer should be consulted in order to ascertain the correct method of balancing. Needless to say, failure to repair damage to a propeller blade iaw the manufacturer's instructions can lead to imbalance.

Vibration caused by a low idle speed will be evident only at idle. Vibration caused by incorrect carburettor synchronisation will be maximised at idle, and decrease in relation to the power setting.

Carburettor synchronisation is accomplished in two stages. The first step is static or mechanical synchronisation and consists of adjusting the carburettors to an equal and optimal setting prior to the more accurate pneumatic synchronisation.

MECHANICAL SYNCHRONISATION

Back off the idle screws sufficiently to allow the throttle slides to close completely. Then screw them in until just touching the slides. If you have previously been suffering from vibration at idle, you

may find that the idle screws are flat-spotted or worn from contact with the slides. If so, this is not going to fix itself or go away if you ignore it. Replace the affected screws.

Turn the mixture screws fully in, then back out one and a half turns.

Adjust the slide bowden cables for simultaneous opening of throttles. This can be done by inserting the shank of a half inch drill bit, or similar, into the throttle opening and lowering the slide onto it with the hand throttle, then ensuring that the slide in the other carburettor matches.

Alternatively, you can raise the slides on the hand throttle to be exactly level with the top of the throttle opening, and check both visually and by feeling with the index finger. When this is done, you should ensure that there is a minimum of 1mm lost motion on the cable. In other words, you should be able to lift the cable outer from the top of the carburettor at least 1mm before seeing any movement of the slide.

Start engine and bring to operating temperature.

Adjust idle screws equally as required to achieve idle speed of 2000rpm. An idle speed lower than this will increase vibration and induce unwanted stresses on the gearbox. Any further increase in idle speed will start to affect the enrichment or choke mixture and make the engine more difficult to start. Once the engine has started, the hand throttle can be advanced as required to reduce vibration.

At idle, turn the mixture screws out to achieve max rpm, then turn the screw back in a quarter of a turn. If necessary, readjust idle.

Finally, further adjustment of the mixture screws may be necessary to bring your EGTs within limits. Turning the mixture screw out or anti-clockwise will lean the mixture and subsequently raise the relevant EGT.

In most cases, mechanical synchronisation alone is sufficient to ensure a smooth running engine. If you have access to suitable equipment then this can be followed by a pneumatic synchronisation. On the side of your Bing carburettor you will find the primer nipple with a rubber cap on it. This is where you connect the synchro tester/gauge, which simply measures the air pressure (vacuum) in the carburettor venturi.

With reference to the gauges, the carburettors may be adjusted on the slide cables to achieve equal off-idle readings. The idle screws will be used to adjust the idle setting. The 1mm minimum lost motion on the slide cables should be maintained.

As always, if you are at all unsure of what you are doing or how to operate any equipment, then consult, or arrange to be supervised by, somebody who is competent.

Safe flying.

