Nose wheel shimmy damper

Classification: Highly recommended

Applicability: All Europa Tri-gear aircraft

Compliance: N/A

Introduction

Nose wheel shimmy has been proved to produce very destructive forces on the nose gear, therefore it is vital to ensure that the shimmy damper is correctly adjusted.

Two reasons for the shimmy damper to go out of adjustment have been identified: the large washer EUR004 can distort such that further tightening of the adjusting nut has no effect, and grease getting on to the friction surfaces will reduce the damping.

This modification introduces modified shimmy damper springs, and an O-ring to prevent any grease from leaking on to the friction pad, with the aim of increasing the interval between adjustments. A sectional view of the nose gear pivot housing shows the new arrangement of the spring washers and the location of the O-ring as shown in Fig. 1.

Action

Using suitable packing, support the nose of the aircraft high enough to allow the nose wheel fork to be removed from the nose leg.

Remove and discard the split pin, remove the castellated nut, the six 28mm diameter spring washers and the EUR004 washer. The EUR004 washer and two of the spring washers will be used later as part of a "puller" and can be discarded subsequently.

The next operation raises the lower bushes in the nose gear housing by 3.3mm (0.13") to allow the insertion of an O-ring (Part no. BS214 supplied with the Mod kit). The spacer and upper bush will also be pushed upwards.

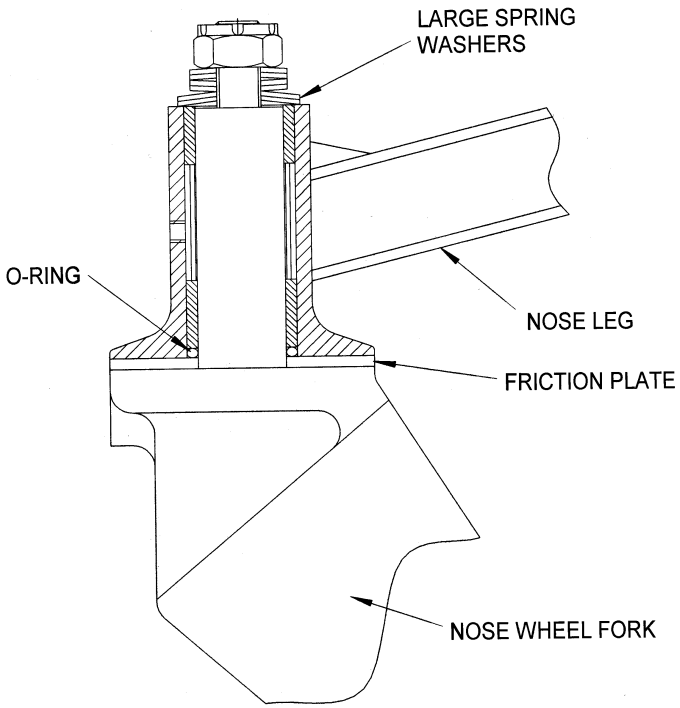

Fig. 1 Arrangement of nose-gear housing and fork assembly.

The positioning of the lower bush is quite important to ensure that the O-ring is slightly compressed on assembly. To move the bush up the requisite amount, you should now use the nose gear fork assembly as a "puller". Firstly, though, it is necessary to remove the pin which locates into the friction plate.

Included in the kit is spacer part number NG03G and a distance ring NG03F. Mount the nose gear fork with the distance ring NG03F slid onto the pivot shaft, ensuring that it is concentric and bearing correctly on the lower Oilite bush; then fit the upper spacer NG03G above the housing, with the old EUR004 and the two old spring washers above them, fit the castellated nut, and screw it carefully down to pull up the bushes in the housing. See Fig. 2.

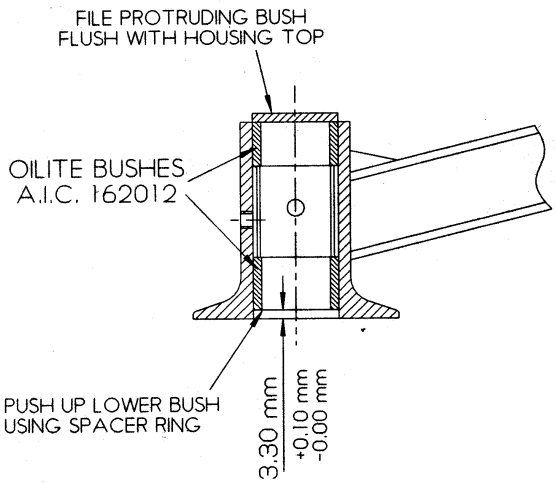

Fig. 2 Position of Oilite bushes.

Remove the nose gear assembly, and the distance ring NG03F and spacer NG03G, and check that the bush has moved the required amount. Now file off the top of the upper Oilite bush until it is flush with the top of the housing, then make sure all the resulting swarf is cleaned away.

Although not essential, it may be beneficial to cut shallow grooves into the bushes to enable grease to pass through more easily. Cut two axial grooves in each bush, one on each side, using a fine toothed hacksaw. After de-burring the edges of the grooves with a small file, clean out any swarf before reassembly.

To reassemble the unit, fit the supplied O-ring into the space created by the distance ring NG03F, and don't forget to re-insert the friction plate pin. Refit the wheel fork assembly as shown in figure 3, and refill the housing with grease. Adjust the castellated nut such that a pull of 8 - 9 Kg (18 - 20 lb) is required at the back of the nosewheel tyre to overcome the friction.

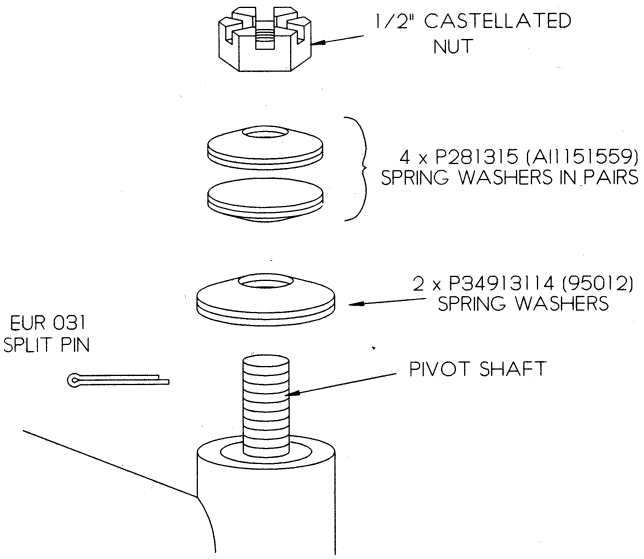

Fig. 3 Assembly of spring washers.