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固体力学与飞行器设计

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### 某型飞机尾起落架转弯困难分析

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#### Analysis on Difficulty in Turning of Airplane Tail Landing Gear

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摘要

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**摘要** 推导了某型飞机尾起落架支柱转角与缓冲器行程的关系, 以及尾起落架支柱转角与轮轴倾角之间的关系, 并指出在停机载荷下, 尾起落架轮轴倾角受到支柱转角的影响。将某型飞机与它同类型飞机尾起落架的转弯情况进行了比较, 发现某型飞机尾起落架转弯困难的原因是: 在停机载荷下, 缓冲器压缩量较大, 轮轴转动较小的角度就可以导致轮轴与地面之间产生较大的倾角。在满足缓冲性能的基础上, 将某型飞机的尾起落架缓冲器重新进行了充填, 提高其充气压力, 减少灌油量, 使尾起落架缓冲器在停机载荷下的压缩量为0。缓冲器经过重新充填后, 在停机载荷下, 该型飞机尾起落架轮轴与地面的倾角始终为0°, 机轮垂直地面, 即使在小转弯半径条件下, 牵引转弯和首飞滑跑转弯时, 尾起落架机轮左右转动也很灵活。改变该飞机尾起落架缓冲器充填参数后, 解决了转弯困难的问题。

**关键词:** 尾起落架 转弯困难 支柱转角 轮轴倾角 缓冲器充填参数 支柱

**Abstract:** The relationships between the main strut rotating angle and the buffer displacement, and between the main strut rotating angle and the axle incline angle are established for a certain airplane tail landing gear. When the tail landing gear is exposed to weight loading, the axle incline angle is affected by the main strut rotating angle. The turning performance of this airplane is compared with that of the same type of airplane tail landing gear. The reason for difficulty in turning is found to be that the buffer displacement is too great when the tail landing gear is subjected to weight loading, so that the axle incline angle is very large even when the wheel fork is turning a small angle. While ensuring good shock absorption performance, the tail landing gear buffer is filled afresh with higher pressure and less hydraulic oil, which reduces the buffer displacement to zero when the tail landing gear is under weight loading. The axle incline angle is always zero degree after changing the buffer parameters, and the tail wheel remains perpendicular to the ground and the wheel fork is free to run in towing turning and taxiing turning in the first flight test even with a small turning radius. Thus, the difficulty in turning is solved by changing buffer parameters.

**Keywords:** tail landing gear difficulty in turning main strut rotating angle axle incline angle buffer parameters struts

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