Aeronca – 8” Maule Tailwheel Shimmy

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Abstract This article describes the method used by Champion Aircraft Corporation in 1954 to address Maule 8”pneumatic tailwheel shimmy on Aeronca 7EC and similar model aircraft.

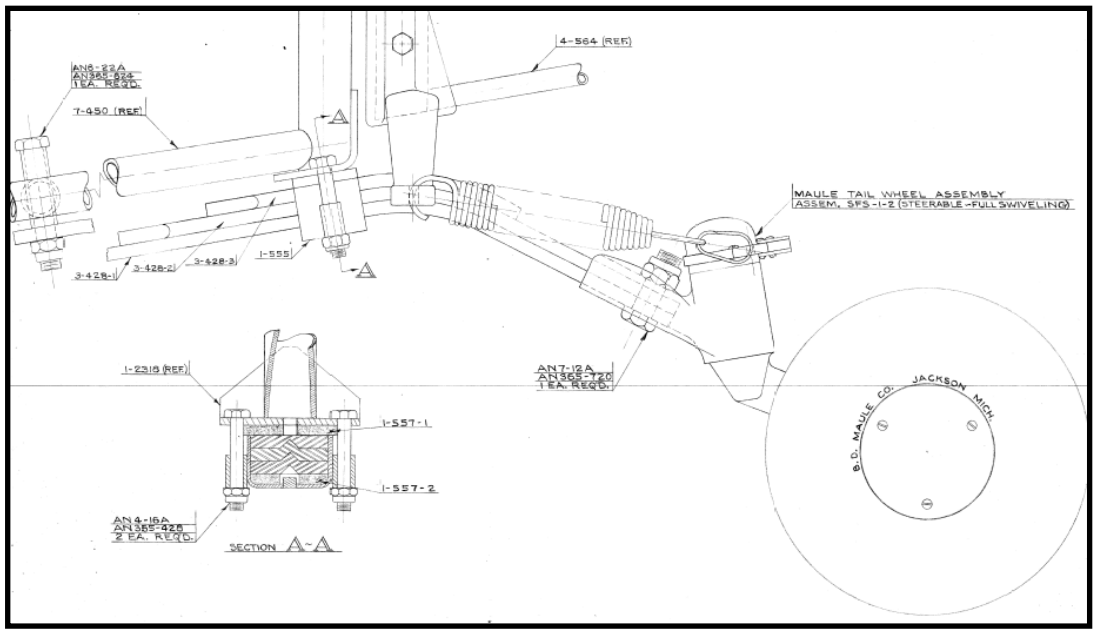
In June of 1954, after acquiring the Aeronca type certificate, Champion Aircraft issued some new drawings for installing the **Maule 3FS-1-2-P8** tailwheel on several model aircraft including the 7EC, 7GC, 7KC, 7GCA, 7GCBA, 7ECJA, and the 7KCAB. While it cannot be stated for certain that these new drawings were issued to address the problem of tailwheel shimmy, the solution presented would tend to suggest that shimmy was the problem being addressed.

Champion Aircraft issued drawing 4-1423 and drawing 1-9993 for the installation of a Maule Model 3FS-1-2-P8 tailwheel on the aircraft models previously listed. This is the 8” pneumatic type tailwheel. Drawing 4-1623 duplicates much of the information shown on Aeronca drawing 4-620. Drawing 4-620 was Aeronca’s drawing for the installation of the Maule SFS-1-2 solid tire tailwheel on the 7A, 11A, and 11B aircraft. The part numbers for the three leaf springs are the same and the general method of attachment and installation are about the same. The installation uses the same pads 1-557-1 and 1-557-2.

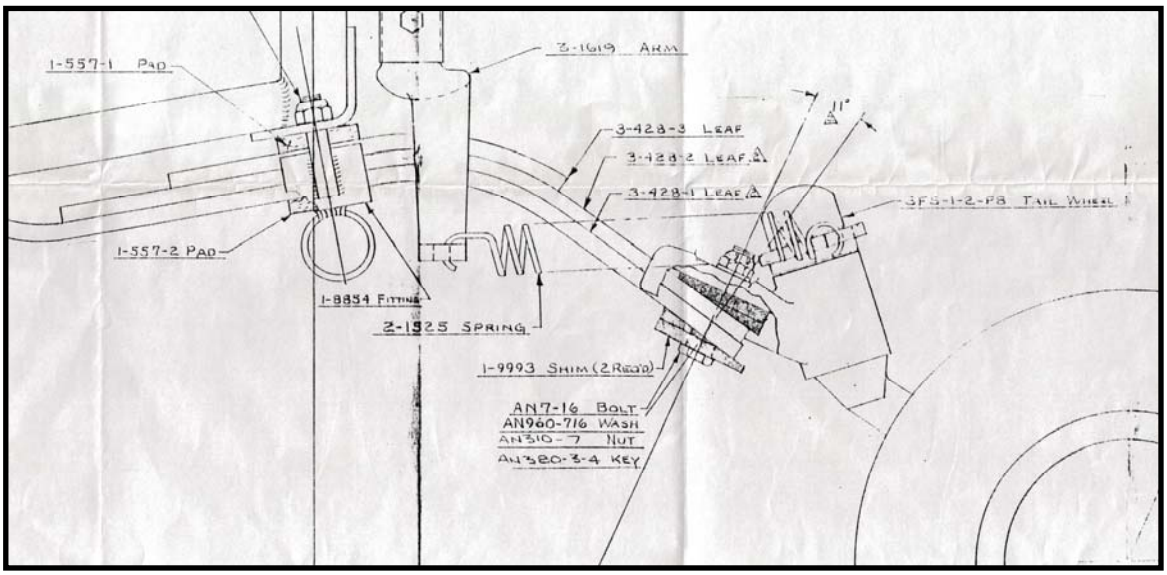
There are three distinct differences between the installation of the Maule SFS-1-2 tailwheel on the Aeronca 4-620 drawing and the installation of the Maule 3FS-1-2-P8 tailwheel on the Champion Aircraft drawing 4-1423:

1. While Aeronca specified the “U” shaped bracket 1-557 (called the fitting assembly), Champion Aircraft used a very similar fitting 1-8854.
2. As previously mentioned the Aeronca design used the Maule SFS-1-2 solid tire tailwheel while the Champion Aircraft design used the Maule 3FS-1-2-P8 pneumatic tire tailwheel.
3. By far the most notable difference between the installation shown on drawing 4-620 and drawing 4-1423 is that Champion Aircraft installed two additional tapered shims where the tailwheel is attached to leaf spring 3-428-1. A detail from Champion Aircraft drawing 4-1423 and a detail of the tapered shims from Champion Aircraft drawing 1-9993 are shown on the next page. The addition of the two taped shims resulted in the axis of the tailwheel pivot shaft being tilted 11 degrees forward, i.e. when viewing the aircraft from the left side, the axis of the tailwheel pivot shaft and the axis of the tailwheel attachment bolt are rotated 11 degrees counterclockwise.

The following drawing displays a portion of Aeronca drawing 4-620 for the installation of the Maule SFS-1-2 solid tire tailwheel.

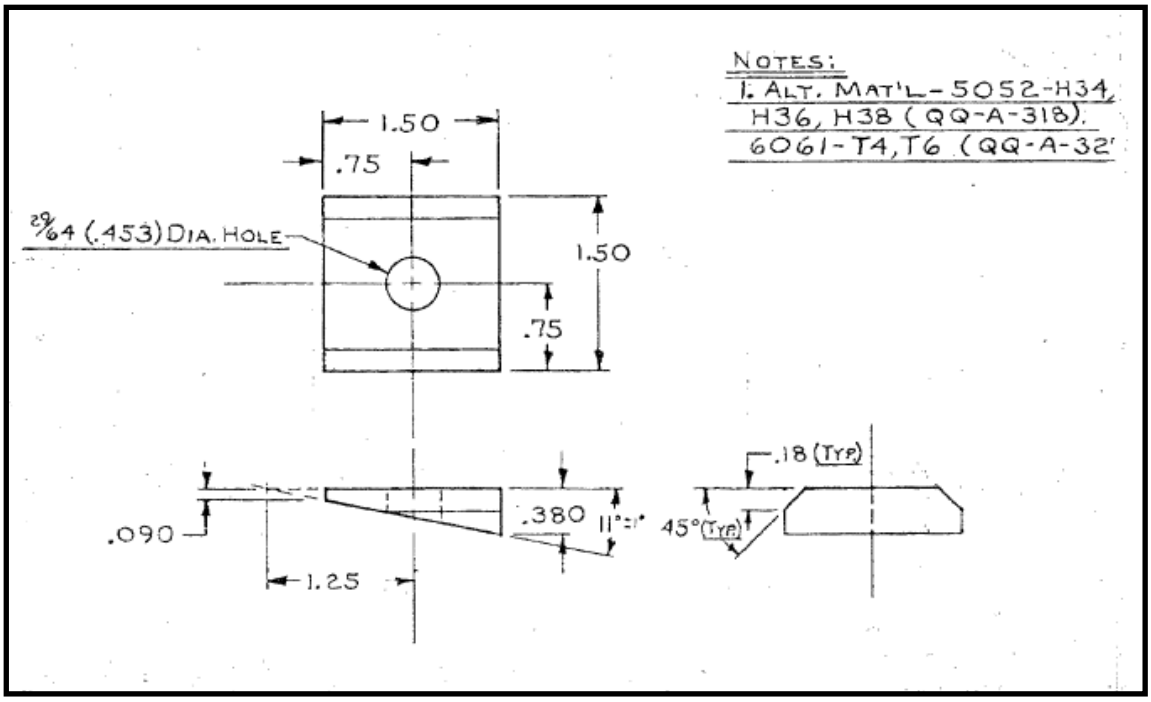


The photo shown below displays a portion of the installation shown on Champion Aircraft drawing 4-1423. for the Maule 3FS-1-2-8P pneumatic tired tailwheel.

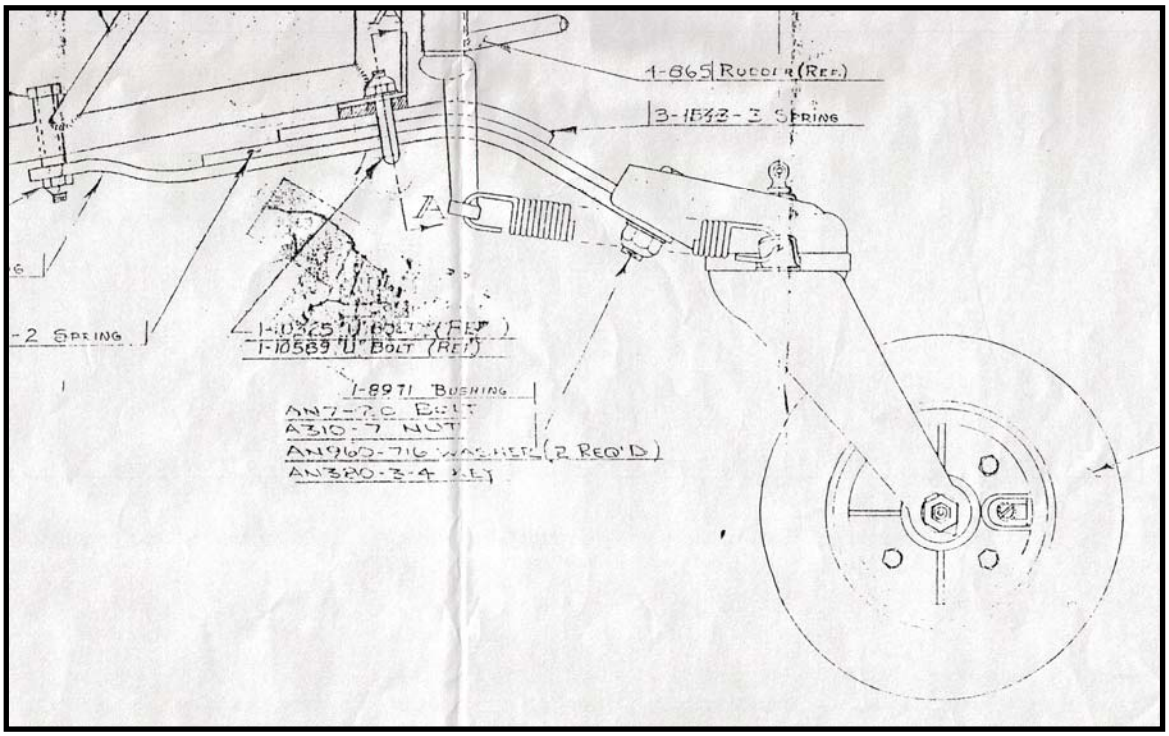


The next detail shows the details of the “Shim – Tailwheel – Maule” shown on n Champion Aircraft drawing 1-9993. The material of construction listed on the drawing was .38” X 1.50” X 1.50” 2024-T3, T4 Aluminum Sheet in accordance with specification QQ-A-362. The number required for assembly is 2 and the

next assembly drawing is shown as 4-1423. The drawing was drawn by Larry Fox and approved by L.G. Nelson on 6/22/65.

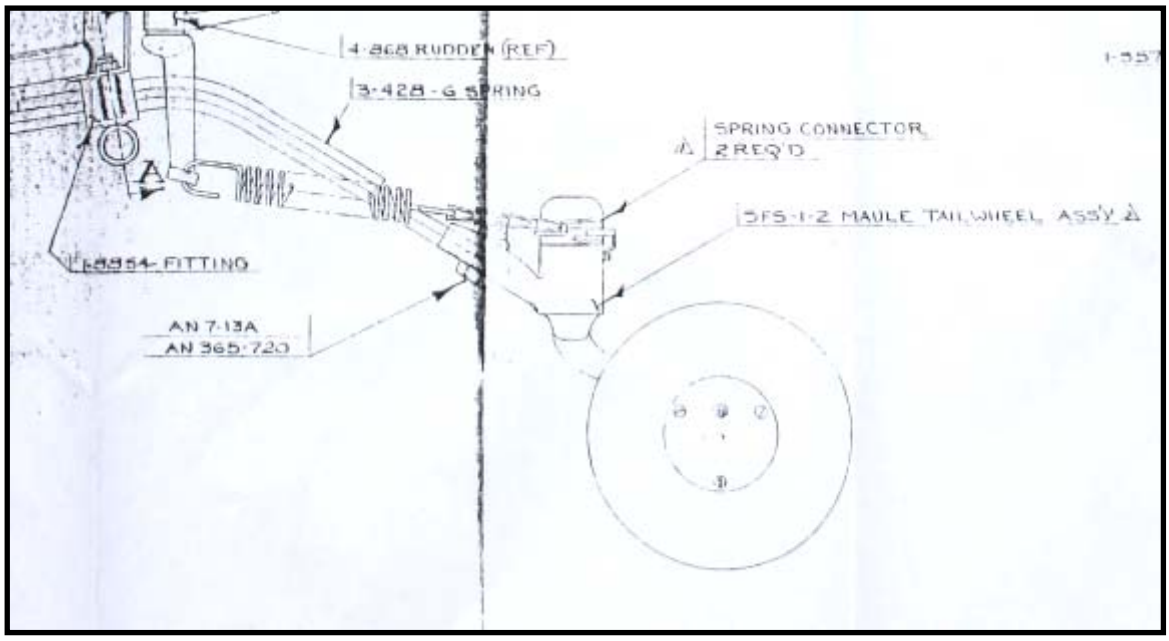


Champion Aircraft also issued two other drawings showing the installation of the 3200 Scott tailwheel assembly and the Maule SFS-1-2 tailwheel assembly.



Drawing 4-1080 displayed the 3200 Scott tailwheel installation. The spring part numbers and method of installation are similar to 4-620 except that an actual “U” bolt p/n 1-10589 is used to attach the springs and pads to the aircraft tailpost. The drawing shows the 3200 Scott tail wheel attached to spring 3-1543-1 and a note states “pivot axis to be vertical +/- 2 degrees in static position”. The drawing is displayed with the aircraft tailpost in the vertical position. Below is a photo of a portion of drawing 4-1080 showing the 3200 Scott tailwheel installation.

Champion Aircraft drawing 4-1042 displayed the installation of a Maule SFS-1-1 tailwheel. The photo below is a portion of this drawing. Notes on the drawing indicate that a model SS-1-2 could be used as an alternate.
The drawing shows the model SS-1-2 wheel attached to the lower spring p/n 3-428-4 with pads 1-557-1 and 1-557-2 and fitting 1-8854. While the drawing does not indicate the position of the pivot axis, it would appear to be at or near vertical with the aircraft tailpost in the vertical position.



The purpose of this article is to not to recommend that the axis of pivot for a tailwheel should be canted forward, backward, or be straight up, but rather to present the data presented on the Champion Aircraft Company drawings.

It is important to remember that all inspection, maintenance, alterations, and documentation should be done in accordance with Part 43 of the Federal Aviation Regulations (FAR).