

ABI-DST3-ICA  
T3 Tailwheel Suspension System  
Instructions for Continued Airworthiness Manual

Instructions for Continued Airworthiness

of:

## **T3 Tailwheel Suspension Systems**

Manufactured by ABI, LLC



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**List of Revisions**

| <b><u>Revision</u></b> | <b><u>Date</u></b> | <b><u>Page</u></b> | <b><u>Description</u></b>   |
|------------------------|--------------------|--------------------|---|
| -                      | 1/13/2017          | ALL                | Initial Release   |
| A                      | 7/18/2019          | 5                  | Updated 4.1.2 and 4.1.3   |
| B                      | 11/30/2022         | 8                  | Added Section 5 (Troubleshooting) and Section 6 (Airworthiness Limitations) |

## 1 Introduction

This manual addresses the instructions for continued airworthiness for the dual coil-over shock variants of the T3 Tailwheel Suspension System. It is published for the guidance of qualified maintenance personnel responsible for the installation and continued airworthiness of a dual shock T3 Tailwheel Suspension System.

### 1.1 Purpose

This manual provides the necessary procedures to accomplish the continued airworthiness of an ABI, LLC dual shock T3 Tailwheel Suspension System. The manual should be retained by the owner or the maintenance facility for future reference.

## 2 Applicability

The dual shock ABI, LLC T3 Tailwheel Suspension System is applicable to the aircraft models listed in the ABI, LLC Approved Model List, ABI-DST3-AML. Each aircraft model will have a corresponding ABI, LLC part number for the approved assembly that it is compatible with.

## 3 Equipment Description

The suspension system consists of a coil-over style tail spring assembly as a direct replacement for the leaf spring style tail springs currently used. The design features dual coil springs and oil shocks that work in tandem to absorb landing energy and reduce rebound. The result is less stress on the fuselage and improved aircraft control on landing rollout, take off, and taxi.

The suspension system incorporates structural mounting brackets and side fixture plates to provide a stable basis upon which the suspension system operates. Standard AN hardware is used to fasten the assembly together and to secure the assembly to the fuselage. There are two adjustable portions of the assembly, one is the pre-load, and the other is the rebound. The pre-load is adjusted by turning the spring perch nut to either compress or extend the spring's static length. Rebound damping is adjusted by turning the adjustment knob at the top of the shock. Both settings are preset at the optimum setting from the factory and are not intended to be adjusted. Pilots should regularly check to verify the factory settings are maintained during routine pre-flight inspections.

## 4 Instructions for Continued Airworthiness

This section is designed to provide aircraft technicians with sufficient information to inspect, troubleshoot, adjust, repair, test and remove the dual shock T3 Tailwheel Suspension System.

### 4.1 Inspection Before Flight

**4.1.1** Prior to each flight, visually inspect the T3 Suspension Assembly to ensure that all fasteners are secure; there is no corrosion, cracks, or visible damage. Any indication of these requires the spring assembly to be further inspected in accordance with the Inspection & Repair procedures presented below. No routine lubrication of the assembly is necessary.

**4.1.2** Visually verify that the factory settings of the suspension system are maintained during routine pre-flight inspections. Factory settings are listed below:

Rebound Damping: The preset factory setting for shock rebound is for the knob to be turned all the way to “Slow” or negative “-“ and then backed off one click in the “Fast” or positive “+” direction.

Preload: Factory preload is set with the lower spring perch preload nut tightened up to its initial engagement with the spring plus one additional full turn. This setting is set in the unloaded condition, not while the plane is resting with weight on the tail.

For the purposes of preflight inspection: verify that the preload nut has not loosened by grabbing the spring and checking that there is no free play up and down between the coil spring and the spring perches. Looseness from the nut could result in the spring no longer being held captive to the spring perch.

**4.1.3** At each 100 hour or annual inspection, inspect and service the T3 Suspension Assembly in accordance with the Inspection and Repair procedures laid out in this document. It is recommended to check these adjustments with the tail lifted off the ground or while the T3 Tailwheel Suspension System is uninstalled from the aircraft to verify the settings are maintained.

**4.1.4** For replacement parts, contact the manufacturer using the contact information listed in Section 5.

## 4.2 Remove T3 Tailwheel Suspension System From Aircraft

The dual shock T3 Tailwheel Suspension System is removed from the aircraft as a unit in the same manner as the original leaf spring. It retains the factory attachment points and steering mechanisms.

For detailed instructions, refer to the specific ABI, LLC Installation Instruction document listed for your aircraft and T3 Tailwheel Suspension System combination from document ABI-DST3-AML. Verify that any special conditions for tailspring removal are also followed as listed in your specific aircraft's maintenance manual.

## 4.3 T3 Tailwheel Suspension System Disassembly

**4.3.1** Remove all cotter pins, castle nuts, nylon lock nuts, and bolts; ensure each fastener stack is kept separate.

**4.3.2** Pull side plates apart from shock and swing arm.

## 4.4 T3 Tailwheel Suspension System Inspection and Repair

**4.4.1** Inspect all parts for corrosion or non-cosmetic wear. Any parts that do not pass a visual inspection require replacement. For replacement parts, contact the manufacturer using the contact information listed in Section 5.

**4.4.1.1** To check shock damping effectiveness while T3 Suspension System is installed on aircraft: Turn the adjustment knob all the way to "Slow" or Negative "-" (the most damped case). Lift the tail of the empty aircraft to waist-height and drop it. The coil spring within the T3 Suspension System should compress and then return to its original static position within 1 to 2 oscillations depending on the application. If the tail bounces for more than two oscillations, then the shock should be replaced.

**4.4.1.2** The bushings pressed into the side plates at the pivot points should be inspected for wear. If bushing I.D. has worn to larger than .010" above nominal bolt size for that attach point, then ABI, LLC recommends replacement of bushing.

## **4.5 Assemble T3 Tailwheel Suspension System**

- 4.5.1** Inspect all hardware and parts for corrosion, non-cosmetic wear or damage. Do not assemble the T3 Suspension System with any parts that do not pass a visual inspection.
  
- 4.5.2** To verify all parts are present, follow the exploded diagram shown in the specific ABI, LLC Installation Instruction document for your aircraft model shown in document ABI-DST3-AML. Assemble according to the appropriate diagram and torque all bolts in accordance with Appendix A, aside from the two bolts that locate the fuselage attach brackets. These two can be torqued only hand-tight until installed on aircraft to ease in lining up the attach holes. At which point, they are to also be torqued to the appropriate value in shown in Appendix A.

## **4.6 Install T3 Tailwheel Suspension System Back Onto Aircraft**

The T3 Tailwheel Suspension System is installed as a unit in the reverse order as it was removed in Section 4.2.

For detailed instructions, refer to the specific ABI, LLC Installation Instruction document listed for your aircraft and T3 Tailwheel Suspension System combination from document ABI-DST3-AML. Verify that any special conditions for tailspring installation are also followed as listed in your specific aircraft's maintenance manual.

## 5 Troubleshooting

The following steps are to aid in identifying installation or unit performance related issues.

| <b>Problem</b>  | <b>Cause</b>  | <b>Remedy</b>  |
|---|---|--|
| No rebound damping                                    | Incorrect rebound setting                           | Adjust rebound damping per Section 4.1.2   |
|   | Damaged shock(s)                                    | Replace shock(s)   |
| Excessive or limited vertical travel                  | Incorrect spring pre-load                           | Adjust spring pre-load per Section 4.1.2.  |
|   | Damaged or broken spring(s)                         | Replace spring(s)  |
| T3 suspension assembly moves with respect to airframe | Loose or damaged mounting hardware                  | Remove and replace damaged hardware. Inspect components and aircraft structure visually for cracks, damage, or deformation.            |
|   | Damaged T3 Suspension System attachment components. | Replace damaged T3 Suspension System components.   |
|   | Damaged aircraft tailwheel attach structure.        | Inspect aircraft structure visually for cracks, damage, or deformation.<br><br>Repair aircraft structure in accordance with AC43.13-1B |

## 6 Airworthiness Limitations

The Airworthiness Limitations section is FAA approved and specifies maintenance required under §§43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved. There are no new (or additional) airworthiness limitations associated with T3 Tailwheel Suspension Systems



## 7 Document Distribution

Copies of this document will be distributed to all known purchasers of the T3 Tailwheel Suspension System. Replacement copies and the latest revision of this document are available on the Airframes Alaska website or by using the following contact information below.

Website: [www.airframesalaska.com](http://www.airframesalaska.com)

To request a paper or electronic copy to be sent to you please contact:

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## 8 Appendices

### 8.1 Appendix A – Bolt Torque Specifications

| <b>CAUTION</b><br>THE FOLLOWING TORQUE VALUES ARE DERIVED FROM OIL FREE CADMIUM PLATED THREADS.  |   |   |  |   |
|--|---|---|--|---|
|  |   | <b>TORQUE LIMITS RECOMMENDED FOR INSTALLATION (BOLTS LOADED PRIMARILY IN SHEAR)</b> |  | <b>MAXIMUM ALLOWABLE TIGHTENING TORQUE LIMITS</b> |
| Thread Size  | Tension type nuts MS20365 and AN310 (40,000 psi in bolts) | Shear type nuts MS20364 and AN320 (24,000 psi in bolts)                             | Nuts MS20365 and AN310 (90,000 psi in bolts) | Nuts MS20364 and AN320 (54,000 psi in bolts)      |
| <b>FINE THREAD SERIES</b>  |   |   |  |   |
| 8-36   | 12-15   | 7-9   | 20   | 12  |
| 10-32  | 20-25   | 12-15   | 40   | 25  |
| 1/4-28   | 50-70   | 30-40   | 100  | 60  |
| 5/16-24  | 100-140   | 60-85   | 225  | 140   |
| 3/8-24   | 160-190   | 95-110  | 390  | 240   |
| 7/16-20  | 450-500   | 270-300   | 840  | 500   |
| 1/2-20   | 480-690   | 290-410   | 1100   | 660   |
| 9/16-18  | 800-1000  | 480-600   | 1600   | 960   |
| 5/8-18   | 1100-1300   | 600-780   | 2400   | 1400  |
| 3/4-16   | 2300-2500   | 1300-1500   | 5000   | 3000  |
| 7/8-14   | 2500-3000   | 1500-1800   | 7000   | 4200  |
| 1-14   | 3700-5500   | 2200-3300*  | 10,000                                       | 6000  |
| 1-1/8-12   | 5000-7000   | 3000-4200*  | 15,000                                       | 9000  |
| 1-1/4-12   | 9000-11,000   | 5400-6600*  | 25,000                                       | 15,000  |
| <b>COARSE THREAD SERIES</b>  |   |   |  |   |
| 8-32   | 12-15   | 7-9   | 20   | 12  |
| 10-24  | 20-25   | 12-15   | 35   | 21  |
| 1/4-20   | 40-50   | 25-30   | 75   | 45  |
| 5/16-18  | 80-90   | 48-55   | 160  | 100   |
| 3/8-16   | 160-185   | 95-100  | 275  | 170   |
| 7/16-14  | 235-255   | 140-155   | 475  | 280   |
| 1/2-13   | 400-480   | 240-290   | 880  | 520   |
| 9/16-12  | 500-700   | 300-420   | 1100   | 650   |
| 5/8-11   | 700-900   | 420-540   | 1500   | 900   |
| 3/4-10   | 1150-1600   | 700-950   | 2500   | 1500  |
| 7/8-9  | 2200-3000   | 1300-1800   | 4600   | 2700  |
| <p>The above torque values may be used for all cadmium-plated steel nuts of the fine or coarse thread series which have approximately equal number of threads and equal face bearing areas.<br/> * Estimated corresponding values.</p> |   |   |  |   |

\*Table from AC 43.13-1B, Table 7-1, Page 7-9