Installation Instructions for

Cessna 170 & C305A (USAF O-1A)

T3 Tailwheel Suspension System

P/N: ABI-51525

Manufactured by ABI, LLC

Doc No.: ABI-51525-II

REV A

October 31, 2023

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List of Revisions

Revision	Date	Page	Description
-	6/19/2018	ALL	Initial Release
A	10/31/2023	4-6	Revised applicable models, added Section 5.1.7

1 Introduction

This manual addresses the installation instructions for the Textron Aviation, Inc. (Cessna) 170 & Regal Air, Inc. (Cessna) 305A (USAF O-1A) T3 Tailwheel Suspension System, P/N ABI-51525. It is published for the guidance of qualified maintenance personnel responsible for the installation and continued airworthiness of a T3 Tailwheel Suspension System.

1.1 Purpose

This manual provides the necessary procedures to accomplish the installation of the ABI, LLC T3 Tailwheel Suspension System, P/N ABI-51525 onto a Cessna 170 series or Cessna 305A aircraft. The manual should be retained by the owner or the maintenance facility for future reference.

2 Kit Components

The ABI, LLC T3 Tailwheel Suspension System assembly contains all the components required to replace the existing tail spring on a Cessna 170 or Cessna 305A (USAF O-1A). The ABI-51525 assembly is shown in Appendix A.

3 Applicability

The ABI, LLC T3 Tailwheel Suspension System, P/N ABI-51525 is applicable for installation on a Cessna 170B, Cessna 305A (USAF O-1A), or a Cessna 170/170A with the Textron Aviation, Inc. (Cessna) p/n 0512154-1 Bracket, Tailwheel Mounting installed.

4 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 a coil spring and an oil shock 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. 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.

The OEM tailwheel bracket commonly has a crack in the radius on each side of the bracket (shown below) when used under severe conditions. The T3 suspension system was specifically designed to bypass this area and reacts all tailwheel loads into the heavier tail wheel support structure ahead of the area where cracking occurs. Thus, the T3 suspension system eliminates the need for repetitive inspections of this area. The only action necessary if cracks are found in the area shown during this installation will be to clean and corrosion protect the area. This area will be unloaded and further crack growth will not occur so only environmental protection of the part is required.

Figure 1: Crack Location in 0512154-1 Bracket (each side)

5 Installation Instructions

5.1 Remove Existing Equipment

5.1.1 Chock the aircraft's front tires and lock brakes so the aircraft cannot roll

5.1.2 Properly raise the aircraft tail off the ground following the airframe manufacturer's instructions.

5.1.3 Unbolt existing tail spring from fuselage.

5.1.4 Disconnect the steering chains and spring from the rudder horn.

5.1.5 Remove existing tail spring assembly from airplane.

5.1.6 Remove the bolt securing the tailwheel assembly to the spring and inspect for wear. ABI, LLC recommends replacing any hardware that appears to have any non-cosmetic wear or damage.

5.1.7 Visually examine the area shown in Figure 1 carefully for cracks. If cracks are found, clean and treat the area in accordance with AC 43.13-1B, Para 6-50 using epoxy primer such as MIL-PRF-23377 or equivalent. No further action is required.

5.2 Install T3 Tailwheel Suspension System

5.2.1 Install the T3 Tailwheel Suspension System in place of the leaf spring in reverse order. Replace hardware with hardware supplied in the optional installation kit, or new hardware of appropriate size. Refer to the torque specifications shown in Appendix B.

5.2.2 Install the T3 attach block (Item No. 22) into the unclamped opening where the leaf spring resided previously. It should be installed with the beveled edges facing upwards and the horizontal hole protruding out of the tail cone. Line up the front leaf spring clamp bolt holes with the attachment block. Install the leaf spring bolt through the clamp and attachment block. Reinstall the rear leaf spring clamp around the attachment block. Fully torque according to torque specs in Appendix B.

5.2.3 Bolt both side plates (Item No. 2) onto either side of the tail cone according to the assembly drawing in Appendix A. Ensure that the spacer blocks (Item No. 20) are between the outside of the tail cone and inside of the side plates. Also, that the tail cone shims (Item No. 32) are between the outside of the Cessna angled spacer and inside of the side plates.

5.2.4 Attach the T3 swingarm (Item No. 1) and shocks to the side plates according to the assembly drawing in Appendix A.

5.2.5 Reattach the tailwheel assembly to the T3 Suspension System.

5.2.6 Attach tailwheel steering chains to rudder steering horns. Use the additional length of chain provided in the optional install kit as necessary to achieve proper installation length. Steering chains should be just slack while in the statically loaded position with the tailwheel resting on the ground.

Note: ABI, LLC recommends the use of a bent tailwheel steering arm in conjunction with the T3 Tailwheel Suspension System for optimum steering chain angle.

5.2.7 Verify all hardware is tightened to the torque specs shown in Appendix B.

5.2.8 Verify that the T3 side plates are parallel and maintain the same distance from each other at every attachment point.

5.2.9 Verify all castle nuts are secured with a cotter pin.

5.2.10 Ensure the tailwheel has no lateral free movement. If lateral movement is not eliminated by torqueing the tailwheel attach bolt per Appendix B, then remove the tailwheel assembly from the T3 Suspension System and install optional ABI, LLC tailwheel head shims (ABI-51270) as needed to ensure a tight fit. Reassemble and re-torque tailwheel head attach hardware.

5.2.11 Lower the aircraft to the ground.

5.3 Weight and Balance Computation

The T3 Suspension weighs approximately 7.4 lbs. Revise weight and balance. Make any necessary log book and maintenance record entries.

6 Document Distribution

Copies of this document will be distributed to all known purchasers of the T3 Tailwheel Suspension System, P/N ABI-51525. 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

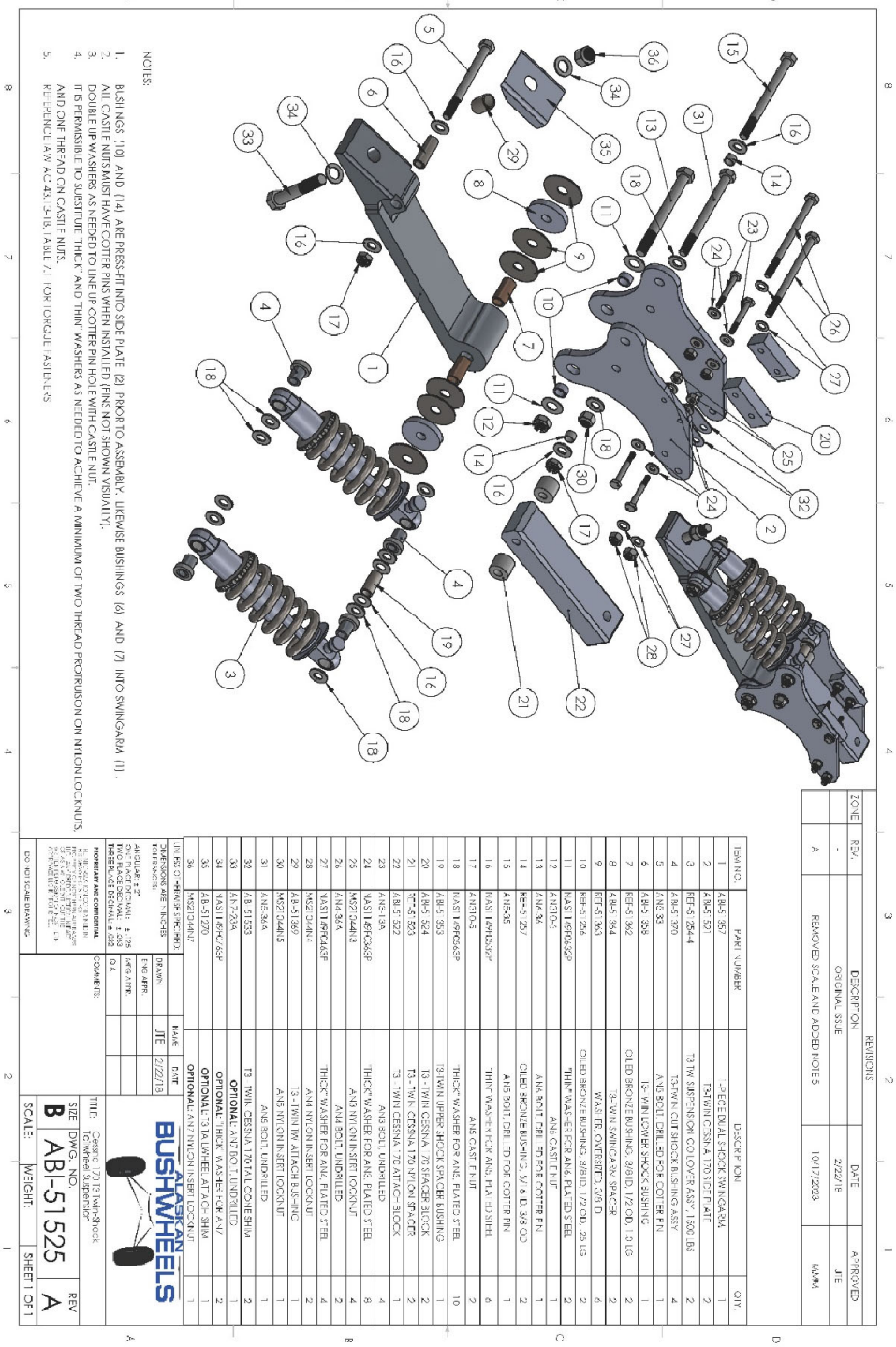
To request a paper or electronic copy to be sent to you please contact:

Airframes Alaska
PO Box 670989
20130 Birchwood Spur Road
Chugiak, AK 99567

Phone: 907-331-4480

7 Appendices

7.1 Appendix A – ABI-51525 Assembly Drawing



7.2 Appendix B – Bolt Torque Specifications

CAUTION THE FOLLOWING TORQUE VALUES ARE DERIVED FROM OIL FREE CADMIUM PLATED THREADS.				
	TORQUE LIMITS RECOMMENDED FOR INSTALLATION (BOLTS LOADED PRIMARILY IN SHEAR)		MAXIMUM ALLOWABLE TIGHTENING TORQUE LIMITS	
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)
FINE THREAD SERIES				
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
COARSE THREAD SERIES				
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
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. * Estimated corresponding values.				

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