

ABI-51343-II
T3 Tailwheel Suspension System
Installation Instructions

Installation Instructions for
T3 Tailwheel Suspension System

P/N: ABI-51343

Manufactured by ABI, LLC



Doc No.: ABI-51343-II

REV A

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List of Revisions

<u>Revision</u>	<u>Date</u>	<u>Page</u>	<u>Description</u>
-	1/13/2017	ALL	Initial Release
A	9/27/2022	5,7	Edited item number callouts, inserted the most recent print for Appendix A

1 Introduction

This manual addresses the installation instructions for the T3 Tailwheel Suspension System, P/N ABI-51343. It is published for the guidance of qualified maintenance personnel responsible for the installation and continued airworthiness of a T3 Tailwheel Suspension System for all listed applicable models shown in document ABI-DST3-AML for the corresponding assembly part number.

1.1 Purpose

This manual provides the necessary procedures to accomplish the installation of the ABI, LLC T3 Tailwheel Suspension System, P/N ABI-51343. 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 for one aircraft. The ABI-51343 assembly is shown in Appendix A.

3 Applicability

The ABI, LLC T3 Tailwheel Suspension System, P/N ABI-51343 is applicable to the aircraft models listed in document ABI-DST3-AML corresponding to that part number.

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 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. 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.

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.

5.2 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** Tighten the front and rear fuselage attach bracket bolts on the T3 Tailwheel Suspension System; Item numbers 18 and 24 on drawing ABI-51343. Use torque specs as listed in Appendix B. These bolts are shipped with minimum torque to allow free rotation of the brackets to ensure ease of aligning attachment holes with those on the fuselage.
- 5.2.3** 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.

- 5.2.4** Verify all hardware is tightened to the torque specs shown in Appendix B.
- 5.2.5** Verify all castle nuts are secured with a cotter pin.
- 5.2.6** 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.
- 5.2.7** Lower the aircraft to the ground.

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- 5.2.8** Spring and shock settings are set at the Manufacturer and do not require adjustment. For information on how to verify and maintain these settings, refer to the Instructions for Continued Airworthiness in document ABI-DST3-ICA.
- 5.2.9** Perform a slow speed taxi test, a straight taxi, and a full 360° turn in both directions to verify proper steering function.

5.3 Weight and Balance Computation

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-51343. 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

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7 Appendices

7.1 Appendix A – ABI-51343 Assembly Drawing

NOTES:

- BUSHINGS (12) AND (13) ARE PRESS-FIT INTO SIDE PLATE (1) PRIOR TO ASSEMBLY. LINE WIRE BUSHINGS (12) INTO SWINGARM (2).
- ALL CASTLE NUTS MUST HAVE COTTER PINS WHEN INSTALLED (PINS NOT SHOWN VISUALLY).
- DOUBLE UP WASHERS AS NEEDED TO LINE UP COTTER PIN HOLE WITH CASTLE NUT.
- TORQUE FASTENERS IN ACCORDANCE WITH AC43-13-B, TABLE 7.1
- IT IS PERMISSIBLE TO SUBSTITUTE "THICK" AND "THIN" WASHERS AS NEEDED TO ACHIEVE A MINIMUM OF TWO THREADS PROTRUSION ON NUT/ON LOCKNUTS, AND ONE THREAD ON CASTLE NUTS.

REVISIONS:

ZONE	REV.	DESCRIPTION	DATE	APPROVED
-	1	ORIGINAL ISSUE	10/28/15	AJH
A	2	UPDATED ITEM 36 FROM ANI-238 TO ANI-238A	12/13/2017	AJH
B	3	SWITCHED TO O.A. WASHERS FROM A.M.A. CH. BRACKET	7/11/2018	JTE

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	ABI-51342	13-TWIN PERFORATED PLATE	2
2	ABI-51347	1-PERCE DUAL SHOCK SWINGARM	2
3	REF-1254-2	13-TW SUSPENSION COLLIDER ASSY 100018	2
4	ABI-51350	13-TWIN UPPER SHOCK SPACER BUSHING	2
5	ABI-51354	13-TWIN REAR ATTACH DOUBLER	1
6	ABI-51355	13-TWIN REAR ATTACH SPACER BUSHING	1
7	ABI-51358	13-TWIN LOWER SHOCK BUSHING	1
8	ABI-51344	13-TWIN SWINGARM SPACER	2
9	ABI-51349	13-TWIN1 W/ATTACH BUSHING	1
10	ABI-51281	13-FRONT HISE AGE ATTACH	1
11	REF-1342	OILED BRONZE BUSHING, 3/8" ID, 1/2" OD, 1.01 LG	2
12	REF-1258	HEAVY DUTY WASHER, 7/16" ID	2
13	REF-1343	WASHER, OVERSIZED, 3/8" ID	2
14	ABI-51370	13-TWIN CUT SHOCK BUSHING ASSY	2
15	AN4-5A	5/16 FTE BOLT, UNDRILLED	4
16	AN4-53	ANS BOLT DRILLED FOR COTTER PIN	2
17	AN4-55	ANS BOLT UNDRILLED	1
18	AN4-55A	ANS BOLT UNDRILLED	1
19	NA511497052P	THIN WASHER FOR AN4, PLATED STEEL	8
20	NA511497054P	THICK WASHER FOR AN4, PLATED STEEL	14
21	AN310-5	ANS CASTLE NUT	2
22	M20104NG	ANS NYLON INSERT LOCKNUT	1
23	AN4-55	ANS BOLT DRILLED FOR COTTER PIN	1
24	AN4-55A	ANS BOLT UNDRILLED	4
25	NA511497043P	THICK WASHER FOR AN4, PLATED STEEL	1
26	AN310-4	ANS CASTLE NUT	1
27	M20104NG	ANS NYLON INSERT LOCKNUT	1
28	M201446-134	COTTER PIN FOR AN4 CASTLE NUT	2
29	M201446-283	COTTER PIN FOR AN4 CASTLE NUT	2
30	REF-1255	OILED BRONZE BUSHING, 3/8" ID, 1/2" OD, 1.14 LG	2
31	REF-1257	OILED BRONZE BUSHING, 5/16" ID, 3/8" OD, 1.14 LG	2
32	M20104E-5	OPTIONAL: NUT, 5/16, UNDRILLED HEAD	1
33	AN7-21A	OPTIONAL: AN7 BOLT, UNDRILLED	2
34	AN7-23A	OPTIONAL: AN7 BOLT, UNDRILLED	1
35	NA5114970743P	OPTIONAL: THICK WASHER FOR AN7	3
36	M20104AN7	OPTIONAL: AN7 NYLON INSERT LOCK NUT	2
37	ABI-51270	OPTIONAL: 13 TAILWHEEL ATTACH SHIM	1

UNITED STATES GOVERNMENT SPECIFICATIONS:

UNITED STATES GOVERNMENT SPECIFICATIONS	UNITED STATES GOVERNMENT SPECIFICATIONS
DOMINION AIR IN HOLES	DOMINION AIR IN HOLES
ROUNDED ENDS	ROUNDED ENDS
ONE FACE DECIMAL, 3 1/2	ONE FACE DECIMAL, 3 1/2
THREE FACE DECIMAL, 2.000	THREE FACE DECIMAL, 2.000

PREPARED AND COMPILED BY: BUSHWHEELS
REVISIONS: 10/28/15
DATE: 10/28/15
APPROVED: AJH

SIZE: DWG. NO. ABI-51343
REV: B
WEIGHT: SHEET 1 OF 1

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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
<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. * Estimated corresponding values.</p>					

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