

Installation Instructions and Instructions for Continued Airworthiness

TEXTRON AVIATION (CESSNA) MODEL 180 & 185 - TITANIUM MAIN LANDING GEAR STC SA01087SE

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1 General

The following instructions cover the installation of Mr. Thomas Anderson TITANIUM MAIN LANDING GEAR assemblies and related parts for the Cessna Model 180 and 185 aircraft.

1.1 Compatibility

Mr. Thomas Anderson manufactured main landing gear parts which have Cessna items listed as optional, (see parts list XP010101PL) may be substituted for the original part without replacing the whole TITANIUM MAIN LANDING GEAR assembly as long as the original manufactured Cessna main landing gear equipment is retained in the assembly.

1.2 Documentation

All Cessna main landing gear parts removed and replaced with TITANIUM MAIN LANDING GEAR shall be done in accordance with XP-INS-010101 instructions, the approved Cessna 180 or 185 service manual and parts catalog for the year, make and model affected.

2 Instructions for Continued Airworthiness (ICA)

This supplemental document is designed to satisfy 14 CFR 23.1529 "Instructions for Continued Airworthiness" required with installation.

2.1 Identification

Refer to the Cessna 180/185 Service manual, Section 5, the Landing Gear Wheels and Brakes and the Cessna 180/185 parts catalog for the specific Model and serial number listed with each product.

2.2 Applicability

This Cessna "Skywagon", Cessna 180 and 185, uses fixed conventional spring landing gear and a tail wheel. This ICA refers to the two gear legs that are bolted and wedged into a gear box that is located at station 20 thru 27. Each Gear leg has mounted to it a fixed axle and a brake assembly that is controlled independently from the cockpit.

2.3 Routine Inspection

The gear will be routinely inspected at 50 hour intervals as specified by the Cessna 180/185 service manual, through an inspection cover above the inboard attach and a cover on the outside of the aircraft where the gear is wedged into place on the outboard bracket. The gear legs are not susceptible to normal corrosion because of the basic properties of Titanium; however, any steel hardware and the aluminum structure is susceptible and the relationship between these metals should be checked at normal inspection intervals for rust and corrosion. Use the cleaning requirements of Titanium as specified in FAA AC43-13-1B Chapter 6 Corrosion Inspection and Protection, Section 11, specifically paragraph 6- 181, Other Metals and Alloys. These Titanium gear are not life limited, nor are any of the attach hardware. It is recommended to change the hardware with new when changing gear legs or after any unusually hard landing as a precaution.

2.4 Troubleshooting and Inspection Procedures

If a hard landing is experienced, use the troubleshooting and inspection procedures in the Cessna 180/185 service manual, Section 5, Landing Gear Wheels and Brakes. If the landing gear or structure surrounding the landing gear is damaged, the landing gear must be replaced or sent back to the manufacture for repair before returning the aircraft to service. If the parts are to be removed, refer to "Titanium Main Landing Gear Installation Procedures" presented in section 3, Cessna 180/185 Service manual: Section 5 "Landing Gear Wheels and Brakes", and the Cessna 180/185 parts catalog for the

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specific model and serial number listed with each product for the sequence of disassembly and replacement of each part. No special tools are required for any inspection of these titanium main spring landing gear.

2.5 Airworthiness Limitations

Airworthiness Limitations – FAA Approved Data Scope: The Airworthiness Limitations Section is FAA approved and specifies maintenance required under 14 CFR Part 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved. Airworthiness Limitations: There are no airworthiness limitations associated with the installation of Mr. Thomas Anderson TITANIUM MAIN LANDING GEAR ASSEMBLIES and related parts for the Cessna Model 180 and 185 aircraft.

3 Titanium Main Landing Gear Installation Procedures

Titanium gear, part numbers XP0741001-77, -77A, -33, or -33A and XP0741001-88, -88A, -44, or -44A shall be installed the same as standard steel gear unless otherwise specified in the following instructions.

XP0741001-33, XP0741001-33A, XP0741001-44, and XP0741001-44A Light duty gear are to only be used with Cessna 180 model aircraft on serial numbers 30000 thru 50911 and 18050912 thru 18053203

3.1 Matched Sets

WARNING

Only matched sets of titanium landing gear may be installed.

3.2 Hardware

WARNING

Do not reuse original hardware in the axle attachment area when installing titanium gear. To do so may result in landing gear failure. Use hardware as listed on parts list XP010101PL. Cadmium plated hardware **MUST NOT BE USED IN THE LOWER AXLE AREA**. The bolts, nuts, washers and shims listed on parts list XP010101PL **MUST BE ADHERED TO**. Cadmium, a common plating material, must not bear against titanium in areas where potential heat soaking can cause cadmium embrittlement, lower axle area only. Use of any hardware other than that called out in the specified parts list could cause conditions in the titanium that may lead to landing gear or hardware failure.

3.3 Main Landing Gear Thickness

WARNING

Due to the elastic material properties of Titanium and Steel, the Titanium Main Landing Gear are manufactured at an increased thickness compared to their steel counterparts. This ensures that the titanium gear stiffness and ground reaction are equivalent to that of the original steel gear during landing. See sections 3.4 and 3.6 for associated installation procedures.

3.4 Wedge Installation

It may be necessary to remove a small amount of material, not to exceed .030 each, from the face of the wedge part number 0441023-2, bracket part number 0713495-61 or the shim part number 0741002-1 to facilitate the fit of the wedge on installation. If this process is done, repaint the bare surface with primer per FAA AC 43.13 1B/2A before installation.

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3.5 CAD Plating

Where any cad plated part, brake torque plate, axle, or ski axles contact the titanium gear, remove the plating from the area. Use fiber scuffing pads or 150 grit sandpaper with a light abrasive action. Re-paint the bare metal surfaces with zinc-chromate primer per FAA AC 43.13 1B/2A. Before installation, coat the inside of the bolt holes, the outside of the bolt and other mating surfaces with zinc-chromate primer and assemble wet.

3.6 Bulkhead Brackets Installation

Replacement bulkhead brackets shall be installed the same as original Cessna parts unless otherwise specified.

3.6.1 Hardware

Install replacement bulkhead brackets with hardware as specified in XP010101A "PARTS LIST BREAKDOWN, HEAVY DUTY", XP010101B "PARTS LIST BREAKDOWN, LIGHT DUTY", and XP010101PL "PARTS LIST"

3.6.2 Angle, Landing Gear Attachment

XP0713495-6 may be installed as an optional replacement for Cessna angle part number 0713495-6.

3.6.3 Inboard Support Brackets

XP0713495-7 and XP0713495-8 may be installed as optional replacements for Cessna inboard bracket part numbers 0713495-7 and 0713495-8

3.6.4 Angle, Landing Gear Support Inboard

XP0713495-18 may be installed as an optional replacement for Cessna part number 0713495-18.

3.6.5 Angle, Landing Gear Support Lower Inboard

XP0742115-26 and XP0742115-25 may be installed as optional replacements for Cessna part numbers 0742115-26 and 0742115-25.

3.6.6 Angle, Landing Gear Support Lower Outboard

XP0713495-18 may be installed as an optional replacement for Cessna part number 0713495-18

3.6.7 Aluminum Outboard Support Brackets

For heavy duty titanium landing gear part numbers XP0741001-77, -77A, -88, -88A, aluminum outboard bracket part numbers XP0713495-611 and XP0713495-622 may be installed as optional replacements for Cessna outboard bracket part numbers 0713495-61 and 0713495-62, respectively. No modification of these replacement brackets is required for installation of titanium main landing gear.

For light duty titanium landing gear part numbers XP0741001-44, -44A, -33, or -33A, use aluminum outboard brackets part numbers XP0713495-61 and XP0713495-62 or FAA-PMA replacements.

3.6.8 Titanium Outboard Support Brackets

The following instructions are applicable to the optional installation of titanium outboard support brackets only.

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For heavy duty titanium landing gear part numbers XP0741001-77, -77A, -88, -88A, titanium outboard bracket part numbers XP0713495-611T and XP0713495-622T may be installed as optional replacements for Cessna outboard bracket part numbers 0713495-61 and 0713495-62, respectively. No modification of these replacement brackets is required for installation of titanium main landing gear.

For light duty titanium landing gear part numbers XP0741001-44, -44A, -33, or -33A, use titanium outboard brackets XP0713495-61T and XP0713495-62T

For permanently installed parts where titanium contacts aluminum surfaces, mating surfaces shall be primed and parts installed with sealant on the faying surface. Use PPG P/S 890 Class B (Pro-Seal) or equivalent.

Wherever aluminum rivets are used with titanium parts, aluminum rivets shall be installed with sealant and then cap-sealed. Use PPG P/S 890 Class B (Pro-Seal) or equivalent.

3.7 Cessna Outboard Support Bracket Modification

When installing heavy duty titanium main landing gear part numbers XP0741001-77, -77A, -88, -88A with Cessna aluminum outboard brackets: the left and right aluminum landing gear outboard support brackets, Cessna part numbers 0713495-61 and 0713495-62, will need up to .045 of material removed from the top and up to .030 from the bottom to facilitate the fit of the support wedges on installation.

3.7.1 Tools Needed

In addition to normal hand tools:

- (1X) small pointed belt sander with multiple grit belts (finish with 220 grit) OR (1X) die grinder with a 3/8-diameter rotary file OR (1X) sharp rasp file.
- (1X) sharp light crosscut file.
- (1X) sharp light 3/8 round file.

3.7.2 Tools Supplied

- GO/NO-GO gage
- GO/NO-GO gage template drawing

3.7.3 Material Removal

Per FAA AC 43.13 1B/2A, use the material removal tools to open up the bracket. Use the go-no-go gage to measure the slot. Make sure the new Titanium gear has clearance for the installation of the wedges.

3.7.4 Surface Preparation

Clean the areas of chips and debris.

3.7.5 Surface Treatment

Per FAA AC 43.13 1B/2A, treat and paint the bare metal surfaces zinc chromate primer.

3.8 Brake Line Clip Installation

Install 2 ea. Brake line clips part number XP0741001-201, XP0741001-202, XP0741001-205, or 1441001-2.

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3.8.1 Bonding Preparation

Remove any primer or paint at brake line clip locations prior to bonding.

3.8.2 Adhesive

Use Hysol EA9309 adhesive or equivalent to attach clips to gear legs.

3.8.3 Upper Clip Location

The bonding location of upper clip is approx. 10" from lower fuselage. Use XP0741001-202, XP0741001-201, or 1441001-2 for heavy duty gear XP0741001-77, -77A and XP0741001-88, -88A. Use XP0741001-205 or 1441001-2 for light duty gear XP0741001-33, -33A or XP0741001-44, -44A.

3.8.4 Lower Clip Location

The bonding location of lower clip is at the bottom of the brake line. Use XP0741001-202, XP0741001-201, or 1441001-2 for heavy duty gear XP0741001-77, -77A and XP0741001-88, -88A. Use XP0741001-205 or 1441001-2 for light duty gear XP0741001-33, -33A or XP0741001-44, -44A.

3.8.5 Alternate Installation Procedures

Alternate method for securing brake lines: In same location, use heavy duty panduit tie wraps, ties or lacing per ASTM-D4066 PA111 and A-A-55622 or later revisions. Secure tightly to avoid slippage. The factory steel brake line clip may be stretched to fit gear leg by re-forming it over the thicker new gear leg. To do this, heat the clip up with a torch until red hot in the bend area and form over a .875 metal block clamping it in place until cool. Remove when cool and re-paint with primer.

4 Revision Log

DATE	REVISION	CHANGE NOTES
08-08-07	A	REMOVED NOTATIONS OF TAPERED GEAR AND BONDING OF STAINLESS SHIM AS NOT REQUIRED. NOT FAA APPROVED
08-04-14	B	WAS: XP MODIFICATIONS; IS NOW: MR. THOMAS ANDERSON. TITLE WAS: INSTRUCTIONS FOR XPM2001 INSTALLATIONS; IS NOW: INSTALLATION INSTRUCTIONS. ADDED SECTIONS 1.1 1.5 INSTRUCTIONS FOR CONTINUED AIRWORTHINESS (ICA). ADDED: SHEET NUMBER BLOCK AND SHEET 7 FOR TABLE OF REVISIONS (REF). 1.0 GENERAL (a), (b), (c) WAS: XPM2001 SERIES MAIN LANDING GEAR; IS NOW: TITANIUM MAIN LANDING GEAR
02-15-16	C	ADDED SECTIONS 1.1- 1.5, INSTRUCTIONS FOR CONTINUED AIRWORTHINESS (ICA) TO ABOVE REV B BLOCK, MISSED AT LAST REVISION. CORRECTED TYPO IN 1.3, WAS ICW, NOW TO READ ICA. ADDED SECTION 1.6, AIRWORTHINESS LIMITATIONS FAA APPROVED DATA. TITLE WAS: INSTALLATION INSTRUCTIONS; IS NOW: INSTALLATION INSTRUCTIONS AND INSTRUCTIONS FOR CONTINUED AIRWORTHINESS (ICA)

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03/05/21	D	SECTION 1.1 -1.6 IS NOW: SECTION 2, "INSTRUCTIONS FOR CONTINUED AIRWORTHINESS". SECTION 2.0 IS NOW: SECTION 3 "TITANIUM MAIN LANDING GEAR INSTALLATION PROCEDURES". REMOVED REDUNDANT MATERIAL REMOVAL WARNING FROM "TITANIUM MAIN LANDING GEAR INSTALLATION PROCEDURES". ADDED TO "TITANIUM MAIN LANDING GEAR INSTALLATION PROCEDURE": PN XP0741001-33/-44. ADDED TO "TITANIUM MAIN LANDING GEAR INSTALLATION PROCEDURE": "XP0741001-33 AND XP0741001-44 LIGHT DUTY GEAR ARE TO ONLY BE USED WITH CESSNA 180 MODEL AIRCRAFT ON SERIAL NUMBERS 30000 THRU 50911 AND 18050912 THRU 18051312." ADDED TO "BRAKE LINE CLIP INSTALLATION": PN XP0741001-205. REMOVED FIGURE 1.
08/15/24	E	FORMAT UPDATE UPDATED PARTS LIST DOCUMENT NUMBER TO XP010101PL THROUGHOUT DOCUMENT ADDED ANNEALED MLG PART NUMBERS TO SECTION 3 "TITANIUM MAIN LANDING GEAR INSTALLATION PROCEDURES" SECTION 3 WAS: "LIGHT DUTY GEAR ARE TO ONLY BE USED WITH CESSNA 180 MODEL AIRCRAFT ON SERIAL NUMBERS 30000 THRU 50911 AND 18050912 THRU 18051312": IS NOW: "...18050912 THRU 18053203" UPDATED SECTION 3.2 "HARDWARE": CLARIFIED CADMIUM EMBRITTLEMENT CONDITIONS, TYPO FIXES REMOVED SECTION 3.6.3 "TEMPLATES" ADDED SECTION 3.6 "BULKHEAD BRACKETS INSTALLATION" RENUMBERED SUBSEQUENT SECTION NUMBERS ACCORDINGLY SECTION TITLE WAS: "OUTBOARD SUPPORT BRACKET MODIFICATION"; IS NOW: "CESSNA OUTBOARD SUPPORT BRACKET MODIFICATION" ADDED CLARIFYING APPLICABILITY LANGUAGE AND PART NUMBERS TO SECTION "CESSNA OUTBOARD SUPPORT BRACKET MODIFICATION" UPDATED SECTION "TOOLS NEEDED": ADDED OPT BELT SANDER UPDATED SECTION "TOOLS SUPPLIED": REMOVED MATERIAL REMOVAL TEMPLATES, ADDED GO/NO-GO GAGE TEMPLATE DRAWING UPDATED SECTION "MATERIAL REMOVAL": REMOVED MATERIAL REMOVAL TEMPLATE INSTRUCTIONS

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