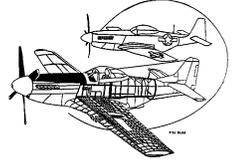


<i>Cal Pacific Airmotive, Inc.</i>	Mandatory Service Bulletin	S.B. No. P51-001 Revision: 0
Title: Inspection of Flight Control System	North American Aviation P-51B, P-51C, P-51D, P-51K, F-51D, F-51K	Issue Date 5-1-2013 Page 1 of 8



ATTENTION: All North American Aviation P-51 Owners, Operators, and Service personnel. Failure to comply could cause loss of control of the aircraft.

BACKGROUND:

Failure of the elevator trim tab and loss of control of the aircraft has been experienced by a North American Aviation (NAA) P-51 aircraft. Contributing factors were worn fiber lock spline nuts at the elevator trim tab hinge attach fittings and the installation of non-structural screws and hardware. Inspection has found that several P-51 aircraft in service today still have the original manufacturer installed self-locking spline nuts, dating back more than 60 years. Spline nuts are a self-locking nut that is pressed into a fitting, and are used throughout the NAA P-51 aircraft.

This Service Bulletin is issued by Cal Pacific Airmotive, Inc. as holder of Limited Type Certificate LTC-11 for the P-51B, C, D, K, F-51D and F-51K models. It is recommended that all P-51 & TF-51 model aircraft comply with this Service Bulletin, including those with an experimental airworthiness certificate.

The following NAA manuals are referenced in accordance with the inspections as outlined in this bulletin:

AN 01-60-3 Structural Repair Instructions for Airplanes A-36A, P-51, A, B, C, D, K and M, F-6B, C, D and K, and TF-51D Revised March 15, 1952.

NA-5913 P-51B and C Maintenance Manual dated July 31, 1944.

01-60JD-4 Parts Catalog P-51B and C dated March 1, 1944.

AN 01-60JE-2 Handbook Maintenance Instructions USAF Series F-51D, ZF-51K, F-51M, TF-51D revised December 20, 1952 (also reference for P-51D through P-51K).

AN 01-60JE-4 Parts Catalog USAF Series F-51D, TF-51D and F-51K Aircraft revised May 15, 1953 (also reference for P-51D through P-51K).

ACTION:

Within the next 20 hours of operation or no later than May 1, 2013 and at each 100 hours of operation, or 12 months whichever occurs first, to prevent failure of aircraft control systems accomplish the following;

1. Inspect all phenolic trim tabs for condition and signs of deterioration or delamination of the trim tab. Replace any defective tab with a serviceable, approved phenolic or metal trim tab.
2. Inspect aircraft control systems for properly installed structural hardware and condition of self-locking nuts and spline nuts in accordance with Maintenance Manual NA-5913, Parts Catalog 01-60JD-4, Handbook Maintenance Instructions AN 01-60JE-2 and Parts Catalog AN 01-60JE-4 where applicable. Self-locking spline nuts P/N 22D8-02 (10-32 thread with fiber insert) should be installed on all trim tab hinge fittings P/N 73-22007. Three hinge fittings are installed on each elevator, aileron & rudder trim tab. New manufactured spline nuts ESNA brand P/N 22ND8-02 have a nylon insert and are available at Cal Pacific Airmotive, Inc.

For proper installation of P/N 22ND8-02 spline nuts install in accordance with Maclean-Esna Precision Fasteners catalog 9203 available online at www.macleanfoggcs.com/products/maclean-esna-nylon-insert-lock-nuts/ Refer to figure "A" attached.

3. When installing structural screws to secure the trim tab to the hinge fitting 73-22007, make sure the screw shank does not bottom in the threads of the spline nut and at least one full thread extends through the locking nut insert.
4. Service life of self-locking nuts & spline nuts. Inspect for condition and corrosion to determine if self-locking nuts & spline nuts are serviceable. Replacement of self-locking spline nuts and self-locking nuts must be accomplished any time you can remove or install a bolt or screw by hand or with less than 3 inch-pounds minimum (prevailing torque) of drag to remove and install the screw or bolt.
5. Install P/N 73-525125 spring (tension) washer when attaching the trim tab hinge fitting to the control surface, at all locations. Per NAA drawing, confirm washer is approximately .020-inches thick, inner diameter 1/4-inch, outer diameter of 9/16-inch and a spring bow of 1/16-inch, made from 1095

spring steel or equivalent. Bushing P/N 73-52535 (length .475 +/- .002) will extend into the spring washer when properly installed. Refer to Figure "B" attached.

6. Inspect for installation of proper AN and special NAA hardware and for condition and corrosion on all control surfaces in accordance with Parts Catalog 01-60JD-4 and AN 01-60JE-4 as applicable. Inspect for proper torque of nuts and bolts and tightening of screws in accordance with Structural Repair Instructions AN 01-60-3 page 499.
7. Inspect rudder and elevator trim tab for free play not to exceed 3/32-inch max allowable play in accordance with NAA drawing No. 73-20001. Repeat same inspection for aileron trim tabs. See figure "C" attached.
8. Inspect Control assembly-Aileron trim tab (Actuator -left aileron) for gap tolerance in accordance with NAA drawing no. 106-52584, parts catalog AN 01-60JE-4 figure 49-21 and figure "C" attached for the P-51D only. For P-51B/C aircraft control assembly P/N 102-52584 is not adjustable. If excessive play is present it is due to worn parts, replace as necessary.
9. Control surface balance should be inspected and accomplished in accordance with NAA Structural Repair Instructions AN 01-60-3.
10. Inspect all surface control cables for condition and correct control cable tension and travels in accordance with Maintenance Manual NA-5913 and Handbook Maintenance Instructions AN 01-60JE-2 where applicable.
11. Inspect all control surface control rods for condition, corrosion, and if bent. Replace as necessary.
12. Inspect rod assembly P/N 73-525124 elevator and rudder trim tab push for condition, wear and proper lubrication of guide. For P-51B/C see Parts Catalog 01-60JD-4 figure 132-74. For P-51D-K and F-51D-K see Parts Catalog AN 01-60JE-4 figure 45-37.
13. Inspect that NAA Technical Order (TO) 01-60-JE-8, Installation of Dorsal Fin and Reverse Rudder Boost Tab P-51D is complied with.

14. Accomplish proper lubrication of aircraft in accordance with Maintenance Manual P-51B/C NA-5913 pages 62-65, and Handbook Maintenance Instructions AN 01-60JE-2 for F-51D through ZF-51K pages 66-70.
15. Restored or refurbished parts are to be finished in accordance with the Finish Specifications for P-51 Series Airplanes structural Repair Manual AN 01-60-3 pages 501- 504 as applicable, or to an equivalent standard. NAA drawing numbers for specific parts will also detail finish specifications. To prevent and eliminate hydrogen embrittlement in steel parts, cadmium plated parts require bake time in accordance with NAA Process Manual Spec. PR3-4A.
16. Inspect aircraft for proper installation of elevator inertia weight P/N 109-52217 in accordance with NAA Technical Order (TO) No. 01-60J-29 for P-51B, C, and D aircraft. Inspect that weight assembly has not been modified and weighs 20.75+/- .5 lbs. Replace as necessary. Installation of weight is to prevent reversal of the elevator control stick forces during maneuvers.
17. Inspect for compliance with NAA TO 01-60-100 "Installation of Metal Covered Elevators" & TO 01-60J-18 "Reinforcement of Horizontal Stabilizer and Fin". Accomplish as necessary.
18. Inspect that Air Speed gauge is marked in MPH in accordance with LTC-11 Operation Limitations and NAA Technical data.
19. To comply with LTC-11, NAA Technical Orders must be complied with for all P-51 aircraft models as specified in the NAA TO, regardless of serial number noted therein. Aircraft exist that have been salvaged, assembled from spare parts and had parts interchanged making serial number compliance questionable.

Recommendations outlined in this Bulletin are to comply with LTC-11 Conditions and Limitations, a copy of which may be found at www.calpacificairmotive.com, and NAA Technical data. Any modifications made to the aircraft require Flight Standards District Office approval (FSDO).

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Inspection of Flight Control System
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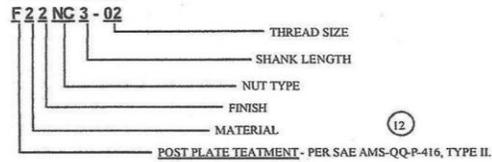
The Federal Aviation Administration requests the cooperation of all operators, service personnel and investigators in reporting a Malfunction Defect Report for all defects noted when accomplishing the above. Submit FAA form 8010-4 (as advised) to your local Flight Standards District Office (FSDO)

Information regarding this bulletin and replacement parts are available at calpacificairmotive.com



MACLEAN-ESNA

PART CODING:



MATERIAL: STEEL

FINISH: CADMIUM PLATE, AMS SAE-QQ-P-416, TYPE I, CLASS 3

LOCKING INSERT: RED NYLON (350° MAX PERFORMANCE)

THREADS: AS8879

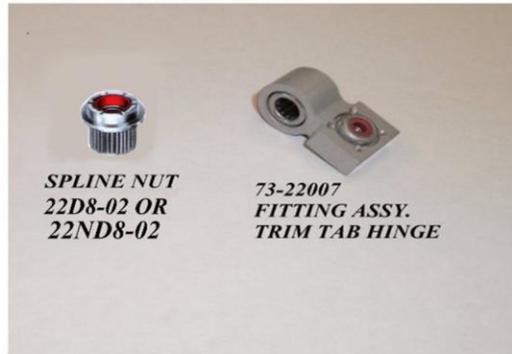
CONCENTRICITY: SHANK O.D. CONCENTRIC WITH P.D. OF THREADS WITHIN .007 F.I.R.

PERFORMANCE: TORQUE NASM25027, AXIAL TENSILE STRENGTH AS LISTED.

APPLICATION: TYPE "ND" SPLINE NUT IS A SELF WRENCHING FASTENER DESIGNED FOR USE IN EITHER BLIND MOUNTED APPLICATIONS OR IN APPLICATIONS WHERE MAINTENANCE CAN BE FACILITATED BY THE USE OF AN ATTACHED NUT. TYPE "ND" SPLINE NUTS ARE DESIGNED PRIMARILY FOR INSTALLATION IN RELATIVELY SOFT MATERIALS, SUCH AS ALUMINUM AND MAGNESIUM ALLOYS, WHICH CAN BE EFFECTIVELY BROACHED BY THE SPLINES OF THE NUT SHANK. ESNA SPLINE NUTS CAN ALSO BE INSTALLED IN CERTAIN TYPES OF STEEL, HOWEVER, IT IS SUGGESTED THAT SUCH APPLICATIONS BE SUBMITTED FOR ENGINEERING RECOMMENDATIONS.

- NOTES:**
- ESNA SPLINE NUTS ARE NOT NORMALLY AVAILABLE IN THE NUMBER 6 THREAD SIZE. ESNA TYPE "NC" CLINCH NUTS ARE BETTER ADAPTED FOR THE THIN SHEET METAL GENERALLY USED IN APPLICATIONS UTILIZING NUMBER 6 SCREWS.
 - IF PARTIALLY THREADED BOLTS ARE USED THE ASSEMBLED DIMENSIONS SHOULD BE CAREFULLY CHECKED TO MAKE CERTAIN THAT THE BOLT WILL NOT "BOTTOM" IN THE THREADS OF THE NUT SHANK. ESNA TYPE ND2398 SPLINE NUT IS RECOMMENDED AS A REPLACEMENT FOR TYPE "ND" IN APPLICATIONS IN WHICH "BOTTOMING" IS A POSSIBILITY. TYPE ND2398 IS A HEAT TREATED SPLINE NUT, THE SHANK OF WHICH IS COUNTERBORED FOR CLEARANCE. THE ND2398 REDUCED THREAD LENGTHS CONFORM TO THE THREAD LENGTHS OF ESNA TYPE "E" AND "M" HEX NUTS, WHICH ARE APPROVED AS NASM21044.
 - IT IS RECOMMENDED THAT AN ARBOR PRESS, OR EQUIVALENT, BE USED TO PRESS THE SPLINE NUT INTO THE MATING MEMBER. PRESSURE SHOULD NOT BE APPLIED TO THE CROWN OF THE NUT.
 - SLIGHT DISTORTION OF THE SHANK MIGHT RESULT FROM INSERTION IN CERTAIN MATERIALS AND PREVENT ENTRY OF THE THREAD GO-GAGE. IT IS IMPORTANT TO NOT INSTALL "ND" SPLINE NUTS IN MATERIALS WHICH WILL DEFLECT THE SHANK INWARD TO A POINT WHICH WILL PREVENT ENTRY OF THE MATING BOLT.

NAA PART NUMBER REFERENCE



SPLINE NUT
 22D8-02 OR
 22ND8-02

73-22007
 FITTING ASSY.
 TRIM TAB HINGE

PJ - 1294

ISSUED: 25 JAN 51 REVISED: 12 3 NOV 2003

REFERENCE STANDARDS: MS51866	NUT - SPLINE	ND PAGE 2 OF 2
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FIGURE "A"

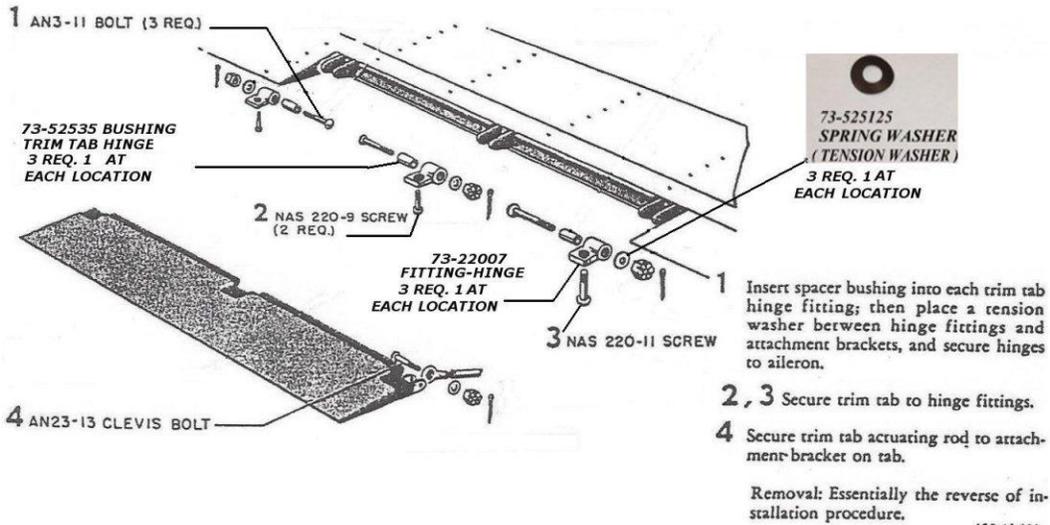


FIGURE 90- INSTALLING AILERON TRIM TABS
REF. MAINTENANCE INSTRUCTIONS PAGE 84 AN 01-60-JE2

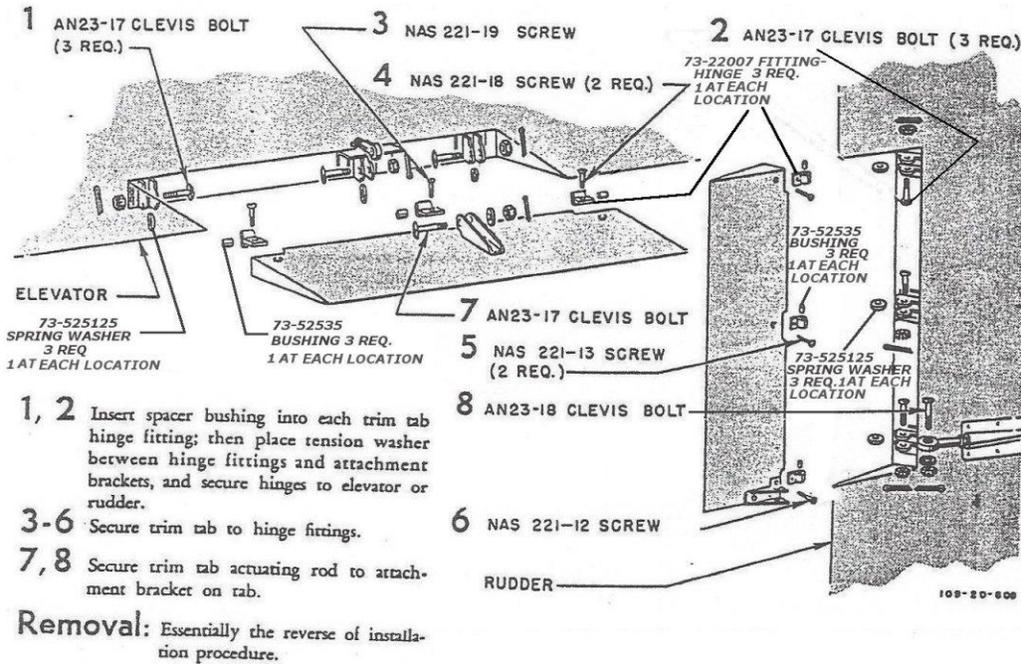
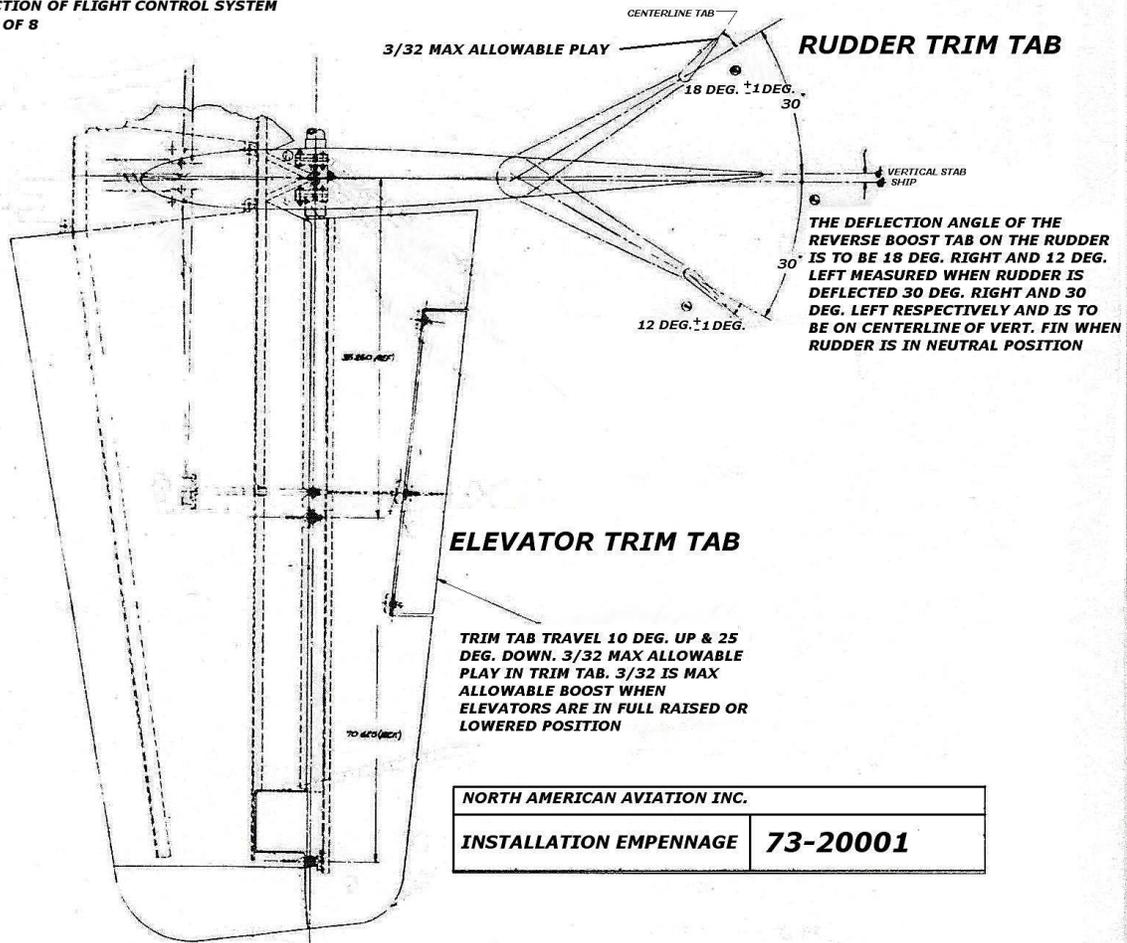
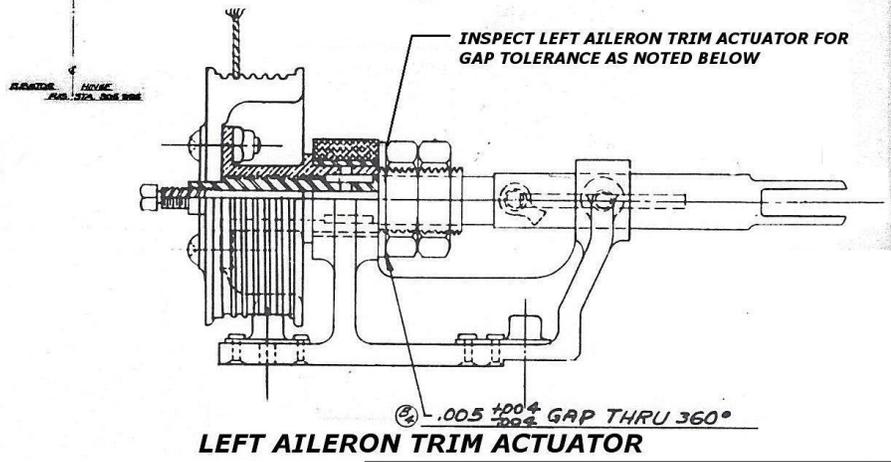


FIGURE 95-- INSTALLING ELEVATOR AND RUDDER TRIM TABS
REF. MAINTENANCE INSTRUCTIONS PAGE 88 AN 01-60-JE2
FIGURE B

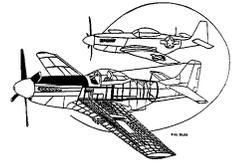


NORTH AMERICAN AVIATION INC.	
INSTALLATION EMPENNAGE	73-20001



NORTH AMERICAN AVIATION INC.	
CONTROL ASSY. AILERON TRIM TAB P-51 D	106-52584
FIGURE "C"	

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Supplement No. 1

ATTENTION: All North American Aviation P-51 Owners, Operators, and Service personnel. Failure to comply could cause loss of control of the aircraft.

BACKGROUND:

Supplement No. 1 to Service Bulletin P51-001 dated May 1, 2013 is to correct information contained in AN 01-60JE-2 Handbook Maintenance Instructions USAF Series F-51D, ZF-51K, F-51M, TF-51D dated December 20, 1944, revised December 20, 1952. Handbook page 84 figure 90 “Installing Aileron Trim Tab” incorrectly notes P/N NAS220-9 and NAS220-11 (8-32 thread structural screws) to be installed in spline nut P/N 22D8-02 (or 22ND8-02) 10-32 thread. This spline nut is installed in each of the trim tab hinge fittings P/N 73-22007.

This Handbook is FAA approved for use in the Limited Type Certificate LTC-11-5 and is also reference for P-51D thru P-51K aircraft. A copy of figure 90 was included in Service Bulletin P51-001, dated May 1, 2013 page 7.

Immediate Action required:

1. Refer to Parts Catalog AN 01-60JE-4 USAF Series F-51D, TF-51D and F-51K Aircraft dated March 10, 1945, revised May 15, 1953, page 20D figure 4B “Aileron Assembly” index no. 33 to install the correct part number structural screw NAS221 series (10-32 thread). This parts catalog is also reference for the P-51D thru P-51K aircraft. Length of screw may vary from those published in the North American Aviation & USAF maintenance and parts manuals if trim tab is original, rebuilt, phenolic or metal covered.
2. When installing structural screws to secure the trim tab to the hinge fitting P/N 73-22007, make sure the screw shank does not bottom in the threads of the spline nut and at least one full thread extends through the locking nut insert.

Continued Page 2

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Supplement No. 1

- Attach this Supplement No.1 to Service Bulletin P51-001 dated May 1, 2013 to update page 7 figure 90 "Installing Aileron Trim Tabs" with figure 90 below to reflect the correct P/N NAS221 Series structural screw 10-32 thread.

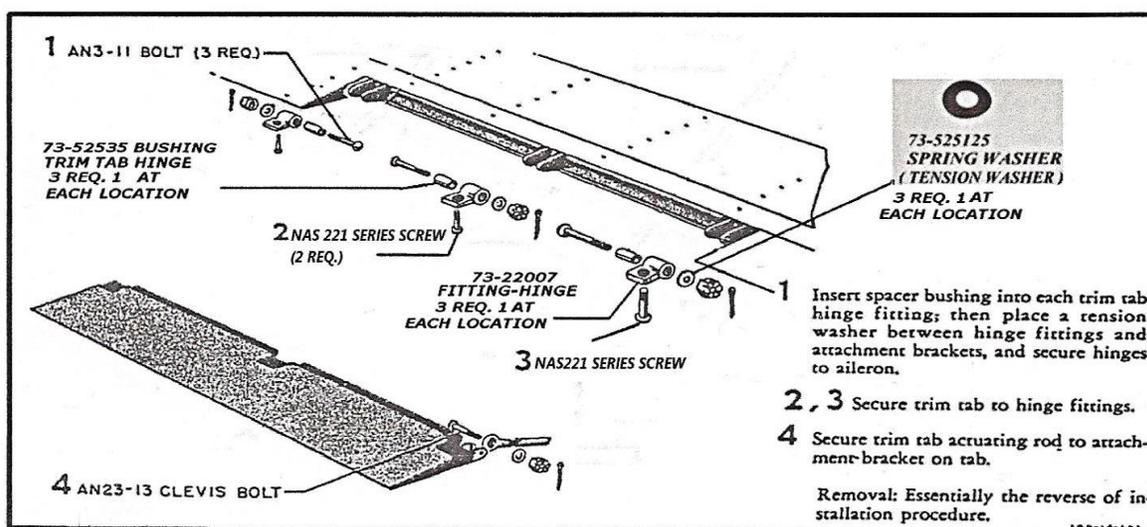


FIGURE 90- INSTALLING AILERON TRIM TABS REVISED UNDER LTC-11-5 MAY 1 2013

- Apply the enclosed adhesive back revised figure 90 to AN 01-60JE-2 Handbook Maintenance Instructions for USAF Series F-51D, ZF-51K, F-51M, TF-51D dated December 20 1944, revised December 20 1952, page 84 figure 90 "Installation of Aileron Trim Tab" to reflect the correct structural Screw P/N NAS221 series 10-32 thread. Also update other manuals as may be deemed necessary.
- Use good maintenance practices to determine proper application of data from any USAF or NAA Technical Manual for P-51 series aircraft.

Information regarding Service Bulletins or replacements parts is available at www.calpacificairmotive.com