

A-6930

NATIONAL TRANSPORTATION SAFETY BOARD
DEPARTMENT OF TRANSPORTATION
WASHINGTON, D.C. 20591

February 27, 1969

Mr. David D. Thomas
Acting Administrator
Federal Aviation Administration
Department of Transportation
Washington, D. C. 20590

Dear Mr. Thomas:

On July 25, 1968, an Allegheny Airlines Convair 580, N5817, was involved in an accident at Morgantown Municipal Airport, Morgantown, West Virginia. During a scheduled landing one of the main landing gear wheels separated from its axle and rolled into the number two propeller. Parts of the wheel were thrown into the side of the fuselage and the propeller separated from the engine, causing an engine fire.

Our investigation of this accident disclosed that the threads of the wheel retaining nut had failed, permitting the nut and the wheel to separate from the axle. Laboratory examination of the failed nut showed that it was made of a comparatively soft, low strength steel (Hardness: 89 Rockwell B, approximate tensile strength 87,000 p.s.i.). The nut was marked "AN7502-39" and we were informed that this was the designation of the nut required for the wheel installation. Also, we were provided with a copy of Allegheny Airlines Fleet Campaign Directive 68-101, dated July 31, 1968, pertaining to a check for excessive wear on main landing gear wheel retaining nuts. This Directive states, under Bill of Material, "as required AN7502-39 nut. Note: Wheel retaining nut should be available to replace worn nuts located by this FCD." However, a used nut from another CV-580 main gear axle, which was obtained for comparison with the failed nut, was marked "MS21025-39." The comparison nut was made of stronger material than the failed nut, showing a hardness of 31 Rockwell C and a tensile strength of about 140,000 p.s.i.

Examination of Air Force-Navy Aeronautical Standard AN7502, Nut, Wheel Bearing Retaining, showed that it contained the following notes:

"(6) CANCELLED AFTER 27 January 1959, USE MS21025.

"(6) The cancelled AN7502 parts are not suitable for use in any application. Use MS21025 parts identified by the same dash number in all design and for replacement of cancelled AN7502 parts in all existing aeronautical weapons and support systems. Safety of flight may be involved."

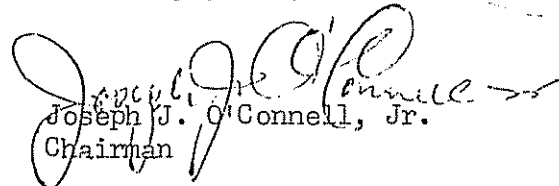
Mr. David D. Thomas (2)

Copies of both AN7502 and MS21025 are enclosed.

In view of the possible serious consequences of the failure of AN7502 nuts in critical applications it is recommended that: (1) Appropriate action be taken to assure that AN7502 wheel retaining nuts now being used by Allegheny Airlines, and possibly by other carriers and in general aviation, be replaced with MS21025 nuts, and (2) an investigation be conducted to determine whether AN7502 nuts are being used in other critical applications in civil aviation where replacement with MS21025 nuts would result in increased safety.

Our staff will be available for any assistance it might be able to give you in this matter.

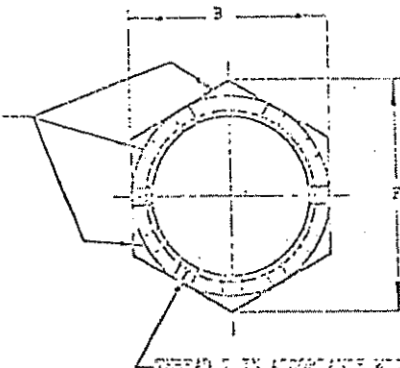
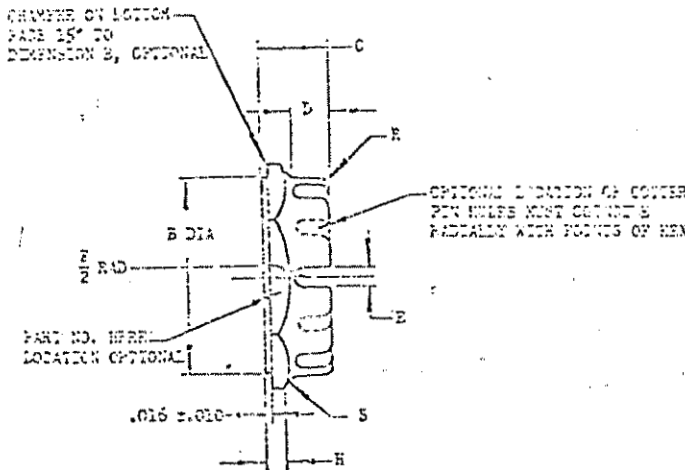
Sincerely yours,


Joseph J. O'Connell, Jr.
Chairman

Enclosures

NOTE: When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility, nor any obligation whatsoever, and the fact that the Government may have furnished the same does not constitute an acknowledgment of its liability in any way for the use of such drawings, specifications, or other data in any other procurement operation or for any manner of invention or invention that may be in any way related thereto.

NOTE: This drawing was approved by Joint Action of the War and Navy Departments as the Army-Navy standard for this product. This drawing provides all pertinent standard drawings for the same product and shall be used for the procurement of this product. It may be used for the procurement of this product, or for use in new designs, not later than 6 months after the date of approval. If more than 6 months after approval.



THREAD T IN ACCORDANCE WITH THE 1950 SUPPLEMENT TO HANDBOOK H-98 CORNER THREAD STANDARDS FOR FEDERAL SERVICES, BOLL. COUNTERSINK 110° TO OD OF THREAD

AN PART NO.	THREAD T		B	C	D	E	F REF	R	R RAD	S RAD	POWER PART NO.
	UNS-58	PITCH DIA									
AN7502-15	.9375-16	.8869	1.250	.531	.219	.156	1.115	.250	.062	.125	AN7502-1
AN7502-16	1.0000-16	.9594		+.0019	.500		.250				1.145
AN7502-20	1.2500-16	1.2094	1.500	.562	.312	.172	1.732	.250	.125	.166	358116-2
AN7502-23	1.4375-16	1.3969	* 1.685				1.915				AN7502-1
AN7502-24	1.5000-16	1.4594	1.750	.655	.203	.203	2.021	.250	.125	.166	358116-3
AN7502-28	1.7500-16	1.7094	2.125				2.154				358116-4
AN7502-31	1.9375-16	1.8969	2.250	.594	.375	.203	2.596	.250	.125	.166	AN7502-2
AN7502-32	2.0000-16	1.9594	2.575	.612			3.319				AN7502-3
AN7502-39	2.4375-16	2.3969	3.500	.812	.425	.203	4.060	.250	.125	.166	AN7502-4
AN7502-47	2.9375-16	2.8969	4.000	1.000			1.135				5.774
AN7502-55	3.4375-16	3.3969	5.000	1.500	.625	5.774	.375	.250			
AN7502-71	4.4375-16	4.3969									

MATERIAL: STEEL, SPECIFICATION QQ-S-633, GRADE 1025.

FINISH: CANTON PLATE, SPECIFICATION QQ-P-416, TYPE I, CLASS C.

REMOVE ALL BURRS.

ROUND OR SQUARE BOTTOM CASTELLATION OPTIONAL.

DIMENSIONS IN INCHES. UNLESS OTHERWISE SPECIFIED, TOLERANCES: DECIMALS ±.016.

IN CASE OF CONFLICT, THE REQUIREMENTS SPECIFIED HEREON SHALL TAKE PRECEDENCE OVER THE REQUIREMENTS OF SPECIFICATION MIL-N-5034.

① CANCELED AFTER 27 JANUARY 1959 USE MS21025.

② FOR DEFINITION AND APPLICATION OF DRAWING STATUS NOTICE, SEE AIA BULLETIN NO. 337.

③ CANCELED AN7502 PARTS ARE NOT SUITABLE FOR USE IN ANY APPLICATION SEE SPECIFIC PARTS IDENTIFIED BY THE S.M. PART NUMBER IN ALL EXISTING AND FOR REPLACEMENT OF CANCELED AN7502 PARTS IN ALL EXISTING AERONAUTICAL WEAPONS AND SUPPORT SYSTEMS. FAILURE OF ELEMENT MAY BE INVOLVED.

PROCUREMENT SPECIFICATION

AIR FORCE-NAVY AERONAUTICAL STANDARD

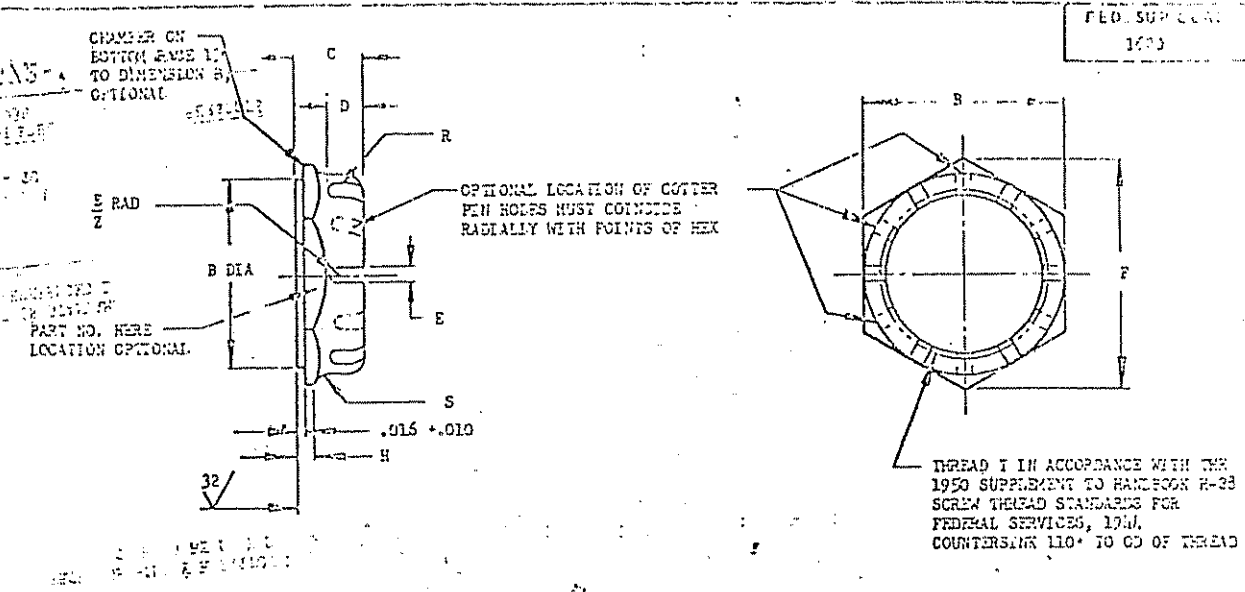
MIL-N-5034

NUT, WHEEL BEARING RETAINING

AN7502

SUPPLEMENT TO HANDBOOK H-98 CORNER THREAD STANDARDS FOR FEDERAL SERVICES, BOLL. COUNTERSINK 110° TO OD OF THREAD

NOTICE—Where Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility, nor any obligation whatsoever; and the fact that the Government may have furnished, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner limiting the liability of the person or corporation, or conveying any right or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.



DASH NO.	TERRAIN T		B	C	D	E	F RFF	H	R RAD	S RAD
	UNS-33	PITCH DIA								
(a) -15	1.0000-15	.9574	1.250	.531	.212					.074
-16	1.0000-15	.9574	1.250	.500	.250	.156				
(a) -20	1.2500-15	1.2094	1.500							
-22	1.4375-16	1.3959	1.750	.562					.062	.125
-24	1.5000-16	1.4524	1.750							
(a) -28	1.7500-16	1.7024	2.125		.312	.172		.250		
-31	1.9375-16	1.8959	2.250	.656						
-32	2.0000-16	1.9524	2.250							
-39	2.4375-15	2.3957	2.875	.812	.406					
-47	2.9375-15	2.8957	3.500	.375						
-55	3.4375-16	3.3959	4.000	1.000	.438	.263			.125	.168
-71	4.4375-16	4.3959	5.000	1.500	.625				.375	.250

(a) INACTIVE FOR DESIGN AFTER 23 July 1959.

MATERIAL: ALLOY STEEL, FED. STD. NO. 66, STEEL NO. 4140 OR 5140.
 PLATING: CADMIUM PLATE, QQ-P-416, TYPE II, CLASS 3.
 HEAT TREAT: ROCKWELL HARDNESS C30-34, MIL-H-6875.
 FOR SURFACE REQUIREMENTS, SEE MIL-STD-10.
 BREAK ALL SHARP EDGES .005 TO .005 AND REMOVE ALL HANGING SURFS AND SLIVERS WHICH MIGHT BECOME DISLODGED UNDER USAGE.

DIMENSIONS IN INCHES. UNLESS OTHERWISE SPECIFIED, TOLERANCES: DECIMAL +.016.

(a) EXAMPLE OF PART NUMBER: MS21025-16-1.000-16 NUT, ALLOY STEEL, CADMIUM PLATED.

INTERCHANGEABILITY RELATION: WITH NUTS AN7502 (25 SEP 1956 REV. 5): MS21025 NUTS CAN UNIVERSALLY REPLACE THE AN7502 NUTS IDENTIFIED BY LINE DASH NUMBERS, BUT AN7502 NUTS CANNOT UNIVERSALLY REPLACE THESE MS21025 NUTS.

THIS STANDARD TAKE PRECEDENCE OVER DOCUMENTS REFERENCED HEREIN.
 REFERENCED DOCUMENTS SHALL BE OF THE ISSUE IN EFFECT ON DATE OF INVITATIONS FOR BID.

P.A. USAF Other Cust Navy - 244r Army - TC	TITLE	MILITARY STANDARD
	NUT, CASTERIALIZED, BEARING RETAINING	MS21025
PROCUREMENT SPECIFICATION	SUPERSEDES: AN7502	SHEET 1 OF 1

APPROVED 13 MAR 57 REVISED 23 JUL 59