

Coded note number: **IC146**

Revision: **B**

Date: **August 8, 2002**

Title: **MODIFICATION TO MIL-B-857 REV A, AMD 5**

MIL-B-857A, AMENDMENT 5, SHALL BE MODIFIED AS FOLLOWS:

PARA 2.1, ADD "MIL-STD-109 QUALITY ASSURANCE TERMS AND DEFINITIONS" UNDER "STANDARDS".

PARA 2.2, ADD "ASTM E8 TENSION TESTING OF METALLIC MATERIALS".

TABLE 1, DELETE LAST COLUMN, ENTITLED "BEND TEST".

PARA 3.1.4.1.1, ADD A NEW SENTENCE TO THE END OF THE PARAGRAPH: "AXIAL TENSILE STRENGTH, IN ACCORDANCE WITH 3.1.4.1.2, SHALL BE PERFORMED IN LIEU OF THE WEDGE TENSILE STRENGTH TEST FOR BOLTS GREATER THAN 1-1/2 INCH NOMINAL SIZE OR WHERE THE BOLT LENGTH IS INSUFFICIENT FOR THE TESTING EQUIPMENT OR WHERE THE LOAD REQUIRED IS BEYOND THE LIMITS OF TEST EQUIPMENT."

DELETE PARA 3.1.4.1.6

DELETE PARA 3.1.4.1.7 AND 3.1.4.1.7.1

ADD NEW PARA 3.1.4.1.10 AS FOLLOWS:

"3.1.4.1.10 BOLTS AND STUDS TOO SMALL FOR MECHANICAL TESTS. BOLTS AND STUDS WHICH ARE TOO SHORT OR HAVE INSUFFICIENT THREADS FOR WEDGE TENSILE, AXIAL TENSILE, ELASTIC PROOF LOAD, AND YIELD STRENGTH TESTS PRESCRIBED HEREIN BEFORE SHALL BE TESTED AS SPECIFIED IN 3.1.4.1.5 OR 4.4.11."

DELETE PARA 3.1.4.2.3.

ADD A NEW PARA 3.1.4.3 AS FOLLOWS:

"3.1.4.3 ESSENTIALLY CONSTANT STRENGTH. BOLTS AND STUDS REQUIRED FOR UNIFORM ENERGY ABSORPTION SHALL BE OF GEOMETRY APPROVED BY THE BUREAU OR AGENCY CONCERNED. (SEE 6.2)."

DELETE PARA 3.4.3.11.

ADD A NEW PARA 3.5.3. AS FOLLOWS:

"3.5.3 BOLTS, STUDS, AND NUTS. BOLTS, STUDS, AND NUTS MADE OF CORROSION-RESISTING STEEL AND NON-FERROUS ALLOYS SHALL BE IDENTIFIED IN ACCORDANCE WITH THE FOLLOWING TABLE:

IDENTIFICATION

MARK INTERNALLY

MATERIAL	EXTERNALLY THREADED	THREADED	
		HOT FORGED PUNCHED	MACHINED FROM BAR
CORROSION-RESISTING STEEL			
AISI 303, 303SE	B8F	8F	8FB
AISI 304	B8	8	8B
AISI 305	B8P	8P	8PB
AISI 316	B8M	8M	8MB
AISI 384	384	384	384
AISI XM-7	XM7	XM7	XM7
MANGANESE BRONZE	675	675	675
NI-AL-BRZ	632	632	632
PHOSPHOR BRONZE	510	510	510
SILICON BRONZE	651	651	651
NAVAL BRASS	464	464	464
NI-CU ALLOY	NICU	NICU	NICU
NI-CU-AL ALLOY	.K. OR NICUK	.K. OR NICUK	.K. OR NICUK

PARA 4.1, DELETE AND SUBSTITUTE:

"4.1 LOT.- FOR THE PURPOSE OF INSPECTION AND TESTS, A LOT EXCEPT FOR NICKEL-COPPER-ALUMINUM ALLOY FASTENERS, SHALL BE HOMOGENEOUS THAT IS CONSISTING OF BOLTS, STUDS, OR NUTS OF ONE MATERIAL, TYPE, GRADE AND STYLE, OF THE SAME NOMINAL SIZE, PRODUCED UNDER THE SAME CONDITIONS INCLUDING HEAT-TREATMENT AND OFFERED FOR INSPECTION AT ONE TIME. FOR NICKEL-COPPER-ALUMINUM ALLOY FASTENERS, A LOT SHALL BE AS DEFINED IN MS-18116. THE LOT SHALL CONSIST OF NOT MORE THAN THE FOLLOWING NUMBERS OF BOLTS, STUDS, OR NUTS:

SIZES 1/4 TO 1/2 INCH	20,000 PIECES
SIZES 9/16 TO 1-1/2 INCH	10,000 PIECES
SIZES OVER 1-1/2 INCH	5,000 PIECES"

PARA 4.2.3.1, ADD A NEW SENTENCE TO END OF PARAGRAPH:

"WHEN A LOT OF FASTENERS CAN BE VERIFIED AS BEING MANUFACTURED FROM MATERIAL FURNISHED WITH OBJECTIVE QUALITY EVIDENCE (SEE MIL-STD-109) TO MEET THE APPLICABLE CHEMICAL REQUIREMENTS, THIS TEST ON FINISHED FASTENERS IS NOT REQUIRED."

DELETE PARA 4.2.3.2 IN ITS ENTIRETY AND SUBSTITUTE THE FOLLOWING:

"4.2.3.2 MECHANICAL TESTS.- FOR PURPOSES OF MECHANICAL TESTS, THE LOT (SEE 4.1) SHALL BE WEIGHED, OR THE WEIGHT SHALL BE CALCULATED. THIS WEIGHT IN POUNDS SHALL BE USED AS THE LOT SIZE AND A SAMPLE SHALL BE SELECTED IN ACCORDANCE WITH MIL-STD-105, USING INSPECTION LEVEL S-1. HOWEVER, THE SAMPLE SELECTED SHALL BE IN PIECES, IN LIEU OF POUNDS, AND THE MINIMUM SAMPLE SIZE SHALL CONSIST OF TWO PIECES FOR EACH REQUIRED MECHANICAL TEST. IF ANY SAMPLE PIECE FAILS TO CONFORM TO THE MECHANICAL TEST REQUIREMENTS OF THIS SPECIFICATION, THE LOT SHALL BE REJECTED. WHEN A LOT OF BOLTS OR STUDS IS MANUFACTURED BY MACHINING FROM FINAL HEAT TREATED BARS WITHOUT SUBSEQUENT HEAT-TREATING OR COLD-WORKING SUCH AS HEADING OR THREAD ROLLING, AND THE BARS HAVE BEEN TESTED AND VERIFIED TO MEET THE HARDNESS, TENSILE, YIELD, AND ELONGATION REQUIREMENTS OF THE FINISHED BOLTS OR STUDS, THE DUCTILITY TEST OF 3.1.4.1.9, THE HARDNESS TEST OF 4.4.2.1, THE ELASTIC PROOF LOAD OF 4.4.3.3, THE WEDGE TEST OF 4.4.3.4, THE UNIT TENSILE STRENGTH OF 4.4.3.4.1, THE AXIAL TENSILE TEST OF 4.4.4, THE YIELD STRENGTH TEST OF 4.4.5 AND THE SHEAR TEST OF 4.4.7 ARE NOT REQUIRED; HOWEVER, THE VISUAL AND DIMENSIONAL INSPECTION REQUIREMENTS OF 4.3 ARE REQUIRED. WHEN BOLTS AND STUDS ARE MACHINED FROM THE HEAT-TREATED BAR STOCK, AND THE STRENGTH AND DUCTILITY REQUIREMENTS ARE TO BE DERIVED FROM THE BAR STOCK, THE FOLLOWING REQUIREMENTS APPLY:

1. FOR STUDS, THE NOMINAL DIAMETER OF THE FINISHED STUD SHALL NOT BE LESS THAN ONE-HALF THE NOMINAL DIAMETER OF THE HEAT-TREATED BAR STOCK.
2. FOR BOLTS 1/2-INCH OR GREATER IN NOMINAL DIAMETER, THE NOMINAL DIAMETER OF THE FINISHED BOLT SHALL NOT BE LESS THAN ONE-HALF THE NOMINAL DIAMETER OF THE HEAT-TREATED BAR STOCK.
3. FOR BOLTS LESS THAN 1/2-INCH NOMINAL DIAMETER, THE NOMINAL DIAMETER OF THE FINISHED BOLT SHALL NOT BE LESS THAN ONE-QUARTER THE NOMINAL DIAMETER OF THE HEAT-TREATED BAR STOCK."

CHANGE PARA 4.4 TITLE TO READ "4.4 MECHANICAL TESTS".

REVISE LINE 1 OF PARA 4.4.2.1 BY INSERTING "STEEL" AFTER "THE HARDNESS OF".

REVISE LINE 1 OF PARA. 4.4.2.2 BY INSERTING "STEEL" AFTER "THE HARDNESS OF".

DELETE PARAGRAPHS 4.4.8 AND 4.4.9.

ADD A NEW PARAGRAPH 4.4.11 AS FOLLOWS:

"4.4.11 TENSION TEST SPECIMEN. BOLT AND STUDS WHICH ARE TOO SHORT OR HAVE INSUFFICIENT THREADS FOR WEDGE TENSILE, AXIAL TENSILE, ELASTIC PROOF LOAD, AND YIELD STRENGTH TESTS SHALL BE TESTED BY PREPARING

AND TESTING TWO STANDARD TENSION TEST SPECIMENS FOR EACH LOT OF BAR STOCK FROM WHICH THE BOLTS AND STUDS ARE MADE. THE PRAPARING AND TESTING OF THE TWO STANDARD TENSION TEST SPECIMENS SHALL BE IN ACCORDANCE WITH ASTM E8. THE TEST SPECIMENS SHOULD BE SUBJECTED TO THE SAME HEAT TREATMENT AS THE BOLTS AND STUDS. THE MECH-
ANICAL PROPERTIES, TENSILE, YIELDS, ELONGATION, AND OBJECTIVE QUALITY EVIDENCE OBTAINED FROM SUCH TESTING SHALL CONFORM TO THE MATERIAL SPECIFIED FOR THE BOLTS AND STUDS. THE OBJECTIVE QUALITY EVIDENCE SHALL BE FURNISHED WITH THE BOLTS AND STUDS."

ADD THE FOLLOWING TO THE END OF PARAGRAPH
4.5.1:

"AS AN ALTERNATE, FOR BOLTS AND STUDS MACHINED FROM FINAL HEAT TREATED BARS, THE DE-CARBURIZATION TEST MAY BE PERFORMED ON THE BAR STOCK. TWO SAMPLE SECTIONS SHALL BE REQUIRED FROM BAR STOCK FROM EACH FURNACE LOAD. THE FINISHED BOLT OR STUD SHALL MEET THE REQUIREMENTS OF 3.1.1.4, AS SUBSTANTIATED BY THE DE-CARBURIZATION TEST ON THE BAR STOCK."

REVISE PARA 6.8 BY DELETING "AND STRUCTURAL" FROM THE FIRST SENTENCE AND BY DELETING REQUIREMENTS IN THE TABLE FOR "BEND TEST:" AND "FLATTENING TEST" UNDER THE "TYPE OF TEST" COLUMN AND UNDER THE "APPLICATION" COLUMN.