

INCH POUND

MIL-S-20517H (AR)
AMENDMENT 4
01 February 1996
SUPERSEDING
AMENDMENT 3
10 APRIL 1991

MILITARY SPECIFICATION

SIMULATOR, PROJECTILE, AIRBURST, M74A1
PARTS FOR AND LOADING, ASSEMBLING AND PACKING

This Amendment forms a part of Military Specification, MIL-S-20517H(AR) dated 4 January 1984, and is approved for use by the U.S. Army Armament, Research, Development and Engineering Center, and is available for use by all Departments and Agencies of the Department of Defense.

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- * 2.1.1: Under Specifications, Military, add: "MIL-A-70625 - Automated Acceptance Equipment Design, Testing and Approval of"

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- 3. 3, Moisture Content: Delete section in its entirety and substitute:

"3.3 Moisture Content: The moisture content of all components used in the simulator shall be as specified in the applicable drawings."

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* 3.8: Add the following paragraph:

"3.8 Radiographic Examination. Radiographic equipment Procedures and evaluation shall be in accordance with MIL-STD-453. Radiographic personnel shall be qualified in accordance with MIL-STD-410. Automated radiographic equipment and procedures shall be used to the maximum extent possible. All equipment and procedures shall be submitted to the Government for approval (See 6.3).

a. Fuze Assemblies - The fuze shall be completely full and shall not show evidence of: incorrect assembly, missing increments as evidenced by voids or density changes, intermediate charge out of position (i.e. , less than two-thirds of the way down the primer end of the fuze tube), or damaged threads.

b. End items - The simulators shall not exhibit any evidence of incorrect assembly, i.e., propellant height lower than minimum, presence of foreign material, fuze assemblies cracked or obviously deviated from normal, or any obvious workmanship defects.

Minimum optical density of the radiograph in the areas being inspected shall not be less than 1.25 and shall be within a density range that will permit proper identification of defects."

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* Table I:

Fuze Housing. Delete "20" and substitute "50".

Fuze Assembly. Delete "20" and substitute "50".

Delete "(Prior to . . . charge hole)" and substitute" (Prior to crimping over fuze disc)".

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* Table I:

Fuze Assembly. Delete "20" and substitute "50".

Charge Case and Loading Assembly (after crimping closing disc). Delete "20" and substitute "50", twice.

Charge Case Loading Assembly (prior to crimping closing disc). Delete "20" and substitute "50".

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* Table I: Assembly (prior to assembling . . . loading assembly).
Delete "20" and substitute "50".

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* 4.4.2.1: Case, Charge. Add Majors:

"101 Outside diameter, max, .40%, 3.2, Gage
102 Pitch diameter of thread, max., .40%, 3.2, Gage
103 minor diameter of thread, max., .40%, 3.2, Gage"

Delete next higher assembly and substitute "8848485".

Delete Minors 203 and 204 in their entirety.

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* 4.4.2.2: Fuze Housing. Delete minors 201, 202 and 203 in their entirety. Add Majors:

"102 Pitch diameter of thread, min., .40%, 3.2, Gage
103 Major diameter of thread, min., .40%, 3.2, Gage
104 Diameter of flash hole, .40%, 3.2, Gage"

Delete next higher assembly and substitute "8848477".

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- * 4.4.2.3: Case, Signal. Delete Minors 201 and 202 in their entirety. Add Majors:

"103 Inside diameter, max., 100%, 3.2, Gage
104 Outside diameter, 100%, 3.2, Gage"

Delete next higher assembly and substitute "8847468".

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- 4.4.2.5: Delete title, "Fuze assembly (prior to drilling igniting charge hole)" and replace with "Fuze assembly (prior to crimping over upper fuze disc)".

- * 4.4.4*5: Fuze Assembly. Critical 1. Delete "Delay" and substitute "Upper" and delete "Gage" and substitute "Gage (Note 1)".

Add Note: "1. Gage to be automated in accordance with MIL-A-70625".

Delete next higher assembly and substitute "8848485".

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- * 4.4.2.6: Fuze Assembly. Delete in its entirety and substitute the following:

**QUALITY CONFORMANCE INSPECTION
CLASSIFICATION OF DEFECTS & TESTS**

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<u>CATEGORY</u>	<u>DEFECTS</u>	<u>CONFORMANCE CRITERIA</u>	<u>REQUIREMENT PARAGRAPH</u>	<u>INSPECTION METHOD</u>
<u>Critical</u> 1	Damaged threads.	100%	3.8	4.5.9
2	Fuze assembly empty or partially loaded (voids, missing increments, inconsistent densities).	100%	3.8	4.5.9
3	Intermediate charge less than two-thirds of the way down the primer end of the fuze tube.	100%	3.8	4.5.9
<u>Major</u> 101	Ignition charge more than .006 in. below flush on side holes.	100%	3.2	Gage (note 1)
102	Upper fuze disc crimp not full 360°.	.40%	3.2	Visual
<u>Minor</u> 201	Evidence of poor workmanship.	100%	3.7	Visual

Note 1: Gage shall be automated IAW MIL-A-70625.

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- * 4.4.2.7: Closing Disc. Delete next higher assembly and substitute "8848485".

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4.4.2.8:

On title, delete "Climping" and substitute "Crimping".

- * Charge Case Loading Assembly (prior to crimping closing disc) . Add Major:

"103 Varnish missing from fuze thread (not 360), note a, 3.2, Gage". Add note "a. For every hour of production, randomly select a sample of 15 units for inspection. Any evidence of noncompliance with the applicable requirement shall cause that hour's production to be 100% inspected and defective units shall be removed from the lot."

- * Delete Minor 201 in its entirety.

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4.4.2.10: Delete critical defect 1 in its entirety and substitute:

<u>Critical</u>	<u>Conformance</u> <u>Criteria</u>	<u>Regt Para</u>	<u>Insp Meth</u>
1. Propelling charge under minimum weight	100%	3.2	4.5.8 or balance
2. Propelling charge missing	100%	3.2	Visual, See Note 1

- * Assembly (prior to assembling charge case loading assembly). Delete next higher assembly and substitute "---".

Add Note 1:

1. This inspection is to insure that only items with propellant are assembled. (The critical inspections are to be performed in the order shown.)

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Add Major 104:

"Major 104, Propelling charge over maximum weight, 0.40%,
3.2, Balance."

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- * 4.4.2.11: Assembly. Delete in its entirety and substitute the following:

**QUALITY CONFORMANCE INSPECTION
CLASSIFICATION OF DEFECTS & TESTS**

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<u>CATEGORY</u>	<u>DEFECTS</u>	<u>CONFORMANCE REQUIREMENT</u>	
		<u>CRITERIA</u>	<u>PARAGRAPH METHOD</u>
<u>Critical</u>			
1	Damaged threads.	100%	3.8 4.5.9
2	Propellant height, min.	100%	3.8 4.5.9 Gage
3	Primer on fuze assembly.	100%	3.8 4.5.9
<u>Special</u>			
1	Cracks on fuze assembly.	100%	3.8 4.5.9
<u>Major</u>			
101	Fuze assembly obviously deviated from normal.	100%	3.8 4.5.9
102	Wad or gas check washer missing.	100%	3.8 4.5.9
103	Evidence of foreign material or any obvious workmanship defects.	100%	3.8 4.5.9
104	Charge case empty.	100%	3.8 4.5.9
105	Top insecure or not fully seated.	.40%	3.2 Manual
106	Primer greater than max. below flush (See Dwg. 8847468).	.40%	3.2 Gage
107	Length, max.	.40%	3.2 Gage
108	Protective coating missing or incomplete.	.40%	3.2 Visual
109	Sealing compound missing on top.	.40%	3.2 Visual
110	Marking misleading, illegible or incorrect.	.40%	3.2 Visual
111	Functioning.	4.4.3.5	3.4 4.5.5

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4.4.3.1 Moisture determination: On Table II, under Requirement Paragraph column, delete in its entirety and substitute "3.3" five times.

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- * 4.4.3.5.1: Delete "seven (7)" and substitute "five (5)". Delete "eight (8)" and substitute "six (6)".
- * 4.4.3.5.2: Delete "four (4)" and substitute "three (3)". Delete "five (5)" and substitute "four (4)".

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4.5.1 Moisture Content: Delete "(See 6.6)"

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4.5.4: Add note at end of paragraph. "Damaged enclosure that may pass non-fragmented parts of the charge case, must be repaired prior to testing."

4.5.8: Add the following:

"4.5.8 Propelling charge weight. The contractor shall have an approved Statistical Process Control (SPC) Management and Detailed Plan in accordance with contract requirements. In accordance with the SPC Management Plan, the weighing process must be in control through elimination of all assignable causes of variability. A process capability study shall verify that the Process Performance Index (Cpk) for the process is 1.33 or better (goal should be to exceed 2.0). A minimum of 40 subsets of five shall be used to determine the Cpk. Once the process is in control, and the required Cpk verified, production SPC sampling shall commence with 2 subsets/hour, using the same size subset used in the process capability study. The subsets must be taken consecutively and each weighting station must be sampled. If any of the out of control conditions specified in the SPC plan are found, the process will be stopped and corrective action taken. Validation of successful corrective action will be by obtaining 20 consecutive subsets in control. Weighing of SPC samples will be performed on a separate calibrated scale than that used on the Production line."

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* 4.5.9: Add the following paragraphs:

"4.5.9 Radiographic Examination. For the end items, one (1) exposure shall be made of each simulator oriented in the vertical position (primer end down) using a horizontal X-ray beam. The beam shall be aligned with the inner shoulders of the signal case.

For the fuze assemblies, one (1) exposure shall be made of each assembly oriented perpendicular to the ignition holes.

The units (end items and fuze assemblies) shall be radiographically inspected and compared to radiographic standards for detection of defects and other applicable requirements of paragraph 3.8. Any end item or fuze assembly deemed unacceptable shall be removed from the lot. The contractor shall establish a system to effectively trace unacceptable units for removal from the lot.

* 4.5.9.1 Radiographic Standards. The contractor shall prepare radiographic standards made out of live materials and showing the following conditions:

For end items:

a. One (1) acceptable simulator (showing full amount of propellant, full delay column, intermediate charge in correct position and correct overall assembly).

b. One (1) unacceptable simulator showing no propellant.

c. One (1) unacceptable simulator showing an empty charge case.

d. One (1) unacceptable simulator showing damaged threads.

e. One (1) unacceptable simulator showing no wad.

f. One (1) unacceptable simulator showing no gas check washer.

g. One (1) unacceptable simulator showing no wad and no gas check washer.

h. One (1) unacceptable simulator showing the minimum amount of propellant required. The contractor shall prepare a gage of

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the height of that minimum amount of propellant and shall use it to inspect for compliance with applicable requirement.

For the fuze assemblies:

- a. One (1) acceptable fuze assembly correctly assembled (full delay column, intermediate charge in correct position, and showing no missing increments as evidenced by voids or X-ray density changes).
- b. One (1) unacceptable empty fuze assembly.
- c. One (1) unacceptable partially loaded fuze assembly (i.e. missing increments as evidenced by voids or X-ray density changes) .
- d. One (1) unacceptable fuze assembly showing the intermediate charge less than two-thirds of the way down the primer end of the fuze tube.
- e. One (1) unacceptable fuze assembly showing damaged threads.

The above standards and the radiograph technique to be used shall be submitted to the Government for approval prior to use for acceptance inspection. See 6.3.

- * 4.5.9.2 Radiographic Sensitivity. For the end items, the radiographs shall show as a minimum the entire outline of: the inner surface of the signal case, the gas check washer, the wad, the threads, the internal diameter of the fuze assembly and other components listed in the applicable requirements. For the fuze assemblies, the radiographs shall show as a minimum the entire outline of: the fuze threads, the internal diameters of the fuze tube and the ignition holes.

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- 6. 6: Change from "Functiong test summary" to "Functioning test summary". In note: Delete "4.4.5" and substitute "4.5.5".

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- * 6. 3: Delete "Research and . . . 07801" and substitute "Research, Development and Engineering Center, Attn: AMSTA-AR-QAT-P, Picatinny Arsenal, NJ 07806-5000." Submission of the radiographic documentation shall be sent to the above address but to Attn: AMSTA-AR-QAT-P.

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