INCH-POUND

MIL-DTL-32047 (OS)
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SUPERSEDING
MIL-DTL-32047 (OS)
29 July 1999

DETAIL SPECIFICATION

INITIATOR, CARTRIDGE ACTUATED, JAU-59/A (MT06)

This specification sheet is approved for use within the Naval Sea Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the requirements for the manufacture and acceptance of the JAU-59/A Cartridge Actuated Initiator, referred to herein as the initiator.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this specification are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified required documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications and standards. The following specifications and standards form a part of this document to the extent specified herein. Unless otherwise specified, the issue of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

DEPARTMENT OF DEFENSE

MIL-D-21625 Design and Evaluation of Cartridges for Cartridge Actuated Devices

Comments, suggestions, or questions on this document should be addressed to DEPARTMENT OF THE NAVY, Indian Head Division, NSWC, Code E11G3, Document Control, 4072 North Jackson Road, Suite 106, Indian Head, MD 20640-5115 OFFICIAL BUSINESS, or emailed to amanda.penn@navy.mil. Since contact information can change, you may want to verify the currency of this information using the ASSIST Online database at http://assist.daps.dla.mil.

AMSC N/A FSC 1377

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MIL-C-83124	Cartridge Actuated Devices/Propellant Actuated Devices General Design Specification for

STANDARDS

DEPARTMENT OF DEFENSE

MIL-STD-810E	Environmental Test Methods and Engineering Guidelines
MIL-STD-1168	Ammunition Lot Numbering and Ammunition Data Card

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from: Standardization Documents Order Desk, Bldg. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

DRAWINGS

NAVAL AIR SYSTEMS COMMAND (CAGE Code 53711)

30003-841AS450-1	SMDC test tip

NAVAL SEA SYSTEMS COMMAND (CAGE Code 53711)

53711-6260971	Test Fixture, Canopy Jettison Initiator, AH-64 Helicopter
53711-6260964	JAU-59/A Cartridge Actuated Initiator

(Application for copies of NAVSEA drawings should be addressed to: Commander, Naval Surface Warfare Center, Port Hueneme Division, (ATTN: Code 5B20, Bldg. 444), 4363 Missile Way, Pt. Hueneme, CA 93043-4307.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM E 545	Standard Method for Determining Image Quality in Direct Thermal Neutron Radiographic Examination
ASTM E 1742	Standard Practice for Radiographic Examination

(Application for copies should be addressed to the American Society for Testing and Materials Customer Service, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

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2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 First article. When specified (see 6.2, and 6.3), a sample shall be subjected to first article inspection in accordance with 4.2. The sample shall be manufactured using the same methods, materials, processes, and procedures proposed for production. Any production of the item prior to acceptance of first article samples without authorization by the contracting agency shall be at the risk of the contractor.

3.2 Primary components. Only one lot primary components shall be used in each lot of initiators, however a primary component lot may be used in more than one initiator lot. The percussion primers and transfer booster charge are the primary components.

3.3 Percussion primers. The percussion primers shall be radiographically examined per ASTM E 1742 and shall be free from defects. The primers shall be from a qualified lot manufactured within 2 years or within one year of primer recertification testing.

3.4 Initiators production. The initiators shall be manufactured in accordance with this specification. Each transfer booster subassembly shall meet the requirements of 3.5.1 through 3.5.3 and each initiator shall meet the requirements of 3.6.1 through 3.6.3. Failure of any initiator to meet the applicable requirements of 3.6.1 through 3.6.3 shall result in rejection of that unit.

3.5 Transfer booster subassembly inspection

3.5.1 Visual inspection. All transfer booster subassemblies shall be visually inspected and screened for defects as outlined in 4.4.1.

3.5.2 Leakage. Each transfer booster subassembly shall be leak tested and shall not exhibit a leak rate in excess of 1×10^{-5} cubic centimeters per second (cm^3/s) of air when tested in accordance with 4.4.2.

3.5.3 Radiographic inspection. Each transfer booster subassembly shall be subjected to x-ray and n-ray examination in accordance with 4.4.3.1. Any observable imperfections in assembly will be cause for rejection.

3.6 Initiators inspection.

3.6.1 Visual inspection. Each initiator shall be visually inspected and screened for defects as outlined in 4.4.1.

3.6.2 Radiographic inspection. Initiators shall show proper assembly, no foreign material, presence of parts, and sealing when x-rayed in accordance with 4.4.3.2.

3.6.3 Firing pin inspection. Free movement, proper alignment and proper protrusion of the firing pin shall be verified during assembly of each firing mechanism in accordance with 4.4.7.

3.7 Environmental test. First article initiators shall be capable of meeting the requirements of 3.7.1 through 3.7.3.

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3.7.1 Vibration. There shall be no evidence of deformation or derangement of components. The initiator shall not autoignite, shall be safe to handle, and shall meet the requirements of 3.6.2, and 3.8 following vibration testing of 4.4.4.

3.7.2 Temperature-Shock/Humidity/Altitude (TSHA). The initiators shall meet the requirements of 3.6.2, and 3.8 after being exposed to the cycle in accordance with 4.4.5.

3.7.3 Shock. The initiators shall meet the requirements of 3.6.2, and 3.8 following shock testing of 4.4.6.

3.8 Ballistic requirements. Initiators shall meet the requirements of 3.8.1 through 3.8.4 when tested in accordance with 4.4.8.

3.8.1 Detonation. Initiator samples from each production and first article lot shall detonate a Shielded Mild Detonating Cord (SMDC) test tip subjected to the test of 4.4.8. The detonating wave shall propagate along the SMDC test tip detonating cord and create a minimum indent of 0.001 inches in a 6061-T6 aluminum plate.

3.8.2 Torque. The torque required to turn the turn-push handle subassembly without the safety pin installed and arm the initiators shall be 5-12 in-lbs when tested in accordance with 4.4.8.

3.8.3 Force. The required force to push the turn-push handle subassembly and actuate each initiator shall be 25-35 lbs when tested in accordance with 4.4.8.

3.8.4 Misfire. There shall be no misfires.

4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. First article inspection (see 4.2)
b. Quality conformance inspection (see 4.3)

4.2 First article inspection. The contractor shall deliver a first article sample of 22 initiators to the activity designated in the contract or purchase order (see 6.2). The transfer booster subassemblies of all 22 initiators shall be subjected to the inspections of 3.5 prior to initiator assembly. Eighteen of the initiator samples shall be subjected to the inspections of table I, and four shall be retained for investigation purposes. Failure of any initiator to meet any of the acceptance criteria specified herein shall be cause for rejection of the first article sample.

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TABLE I. First article test plan.

Test Sequence	Requirement paragraph	Test paragraph	Cartridge Groups				Total
			I	II	III	IV	
Visual	3.6.1	4.4.1	6	6	6	4	22
Radiographic	3.6.2	4.4.3.2	6	6	6	4	22
Vibration	3.7.1	4.4.4		6			6
TSHA	3.7.2	4.4.5			6		6
Shock	3.7.3	4.4.6	6				6
Ballistic test -65 ± 5°F +70 ± 5°F +200 ± 5°F	3.8	4.4.8	 2 2 2	 2 2 2	 2 2 2		 6 6 6
Retains	4.2					4	4

4.3 Quality conformance inspection.

4.3.1 Production inspection. All production initiators shall be inspected and screened to requirements specified in 3.2 through 3.6. Any unit failing to meet the requirements listed in 3.2 through 3.6 shall be rejected and removed from the lot.

4.3.2 Lot acceptance inspection. Lot acceptance inspection shall consist of the examinations and tests specified in Table II. Failure of any sample initiator to comply with the requirements listed in Table II shall be cause for rejection of the lot represented.

4.3.2.1 Sample size. A random sample from each production lot, including the retained sample for investigative purposes, shall be selected in accordance with Table III for lot acceptance inspection. Test samples and those units retained for investigative purposes shall not be applied as part of the quantity specified for delivery by the contract or purchase order.

TABLE II. Lot acceptance inspections and tests.

Inspection/Test	Test Paragraph	Quantity
Visual	4.4.1	All
Radiographic	4.4.3	All
Ballistic test -65 ± 5°F +70 ± 5°F +200 ± 5°F	4.4.8	 1/3 test sample 1/3 test sample 1/3 test sample

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TABLE III. Lot acceptance sampling.

Lot Size	Test Sample Size	Retained Sample Size
2 to 50	9	3
51 to 100	12	3
101 to 150	21	3
151 to 280	33	3
281 to 500	51	4
501 to 1200	81	4

4.4 Inspections and tests.

4.4.1 Initiator and transfer booster subassembly visual inspection. Visually examine all transfer booster subassemblies prior to initiator assembly. Each assembled initiator shall also be visually examined. Reject those units with inadequate or illegible descriptive markings or serial numbers, dents, deep scratches, or other defects which may prevent proper installation or function.

4.4.2 Transfer booster subassembly leak test. Each transfer booster subassembly shall be leak tested in a dry gas leak tester to determine conformance with 3.5.2. Units exhibiting a leak rate in excess of 1×10^{-5} standard cm^3/sec air at a pressure differential of 1.0 ± 0.1 atmosphere shall be rejected.

4.4.3 Radiographic examination.

4.4.3.1 Transfer booster subassembly examination. Radiographic examination of transfer booster subassemblies shall be in accordance with ASTM E 545 and ASTM E 1742. All transfer booster subassemblies shall be identified with serial numbers beginning with 001 prior to examination. The transfer booster subassemblies shall be arranged on trays or boards in consecutive numerical order with any missing serial numbers identified on the radiographic plate. The transfer booster subassemblies shall be positioned for the most revealing exposure with the long axis perpendicular to the radiographic beam. Each radiograph shall carry a permanent identification of the items displayed thereon in a 4×6 inch region maximum. The radiographic identification shall include the part number, the complete lot number, the contract number, and the span of serial numbers displayed. Radiographs of the entire production lot shall accompany the ballistic sample to the activity conducting the tests (see 6.2). Defective assemblies found during radiographic review are to be marked on the radiographic plate and removed from the production lot.

4.4.3.2 Initiator examination. X-ray examination of initiators shall be in accordance with ASTM E 1742. All initiators shall be identified with serial numbers beginning with 001 prior to examination. The initiators shall be arranged on trays or boards in consecutive numerical order with any missing serial numbers identified on the radiographic plate. The initiators shall be positioned for the most revealing exposure with the long axis perpendicular to the radiographic beam. Each radiograph shall carry a permanent identification of the items displayed thereon in a 4×6 inch region maximum. The radiographic identification shall include the drawing number, the complete lot number in accordance with MIL-STD-1168, the contract number, the DODIC, and the span of serial numbers displayed. Radiographs of the entire production lot shall accompany the ballistic sample to the activity conducting the tests (see 6.2). Defective initiator assemblies found during radiographic review are to be marked on

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the radiographic plate and removed from the production lot. A marriage log shall be maintained that relates each transfer booster subassembly by lot number and serial number to each lot and serial number of the initiator.

4.4.4 Vibration test. The initiator shall be subjected to peaks superimposed on random vibration testing in accordance with Method 514.4, paragraph I-3.4.3 of MIL-STD-810E. The duration shall be 1 hour per axis at each temperature (-65°F, 70°F, and 200°F) for a total of nine (9) hours per initiator. The initiators shall then be subjected to gunfire vibration testing. Failure of any initiator to comply with the requirements of 3.8 following exposure to the vibration testing shall be cause for rejection of the lot or first article.

4.4.4.1 Non-Gunfire Random vibration. Random vibration testing shall be conducted from 10 Hz to 500 Hz per figure 514.4-9 of MIL-STD-810E. The superimposed peaks F_1, F_2, F_3, and F_4 are 19.3, 38.6, 57.9 and 77.2 Hz. The Acceleration Power Spectral Density (g^2/Hz) associated with these peaks are as follows:

	Peaks (Hz)	APSD (g^2/Hz)
F_1	19.3	1.93
F_2	38.6	2.5
F_3	57.9	4.6
F_4	77.2	1.05

4.4.4.2 Gunfire Vibration. The initiators shall be subjected to Aircraft Gunfire Vibration per Method 519.4 of MIL-STD-810E, procedure I-4.4.1 Pulse Method. The initiator shall be subjected to 3000 pulses per axis for a total of 9000 pulses. The pulses shall be sawtooth form of 50 g's amplitude and duration of 0.30 milli-seconds at ambient temperature. The frequency of the pulses shall not be less than 0.096 second. Failure of any initiator to comply with the requirements of 3.8 shall be cause for rejection of the lot or first article.

4.4.5 Temperature-Shock/Humidity/Altitude (TSHA). The TSHA test shall be conducted in accordance with the temperature-shock/humidity/altitude test of MIL-C-83124, except that the altitude shall be 21,000 feet (4.38 psia) and only six units will be tested. Failure of any initiator to comply with the requirements of 3.8 shall be cause for rejection of the lot or first article.

4.4.6 Shock. Shock shall be conducted in accordance with Method 516.4, procedure I-3.3c(1)(b) and figure 516.4-4 of MIL-STD-810E. The shock pulse shall be a terminal sawtooth with peak amplitude of 20 g's and an 11 milli-second duration. Three shocks shall be applied in each direction along the three mutually perpendicular axes. Failure of any initiator to comply with the requirements of 3.8 shall be cause for rejection of the lot or first article.

4.4.7 Firing pin assembly inspection. The firing pin used in each initiator shall move freely under its own weight throughout the maximum travel provided for the pin in the firing mechanism. Alignment and degree of protrusion of each firing pin tip shall be verified. Parts not satisfying the requirements shall be discarded.

4.4.8 Ballistic test. The first article or production lot sample of initiators shall be divided into three equal groups. Each group shall be conditioned for a period of time neither less than 4 hours nor greater than 24 hours at -65°F ± 5°F, +70°F ± 5°F, +200°F ± 5°F. The initiators shall be fired per test fixture NAVSEA drawing 53711-6260971, within 5 minutes after removal from temperature conditioning. If any initiator is exposed to the temperature environment for greater than the time allowed, or not fired within 5 minutes after removal, it shall be reexposed to the original environment for not less than 1 hour

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nor more than 24 hours before test firing. The reexposure may be performed as many times as necessary to complete the required ballistic test. A SMDC test tip, NAVAIR drawing number 30003-841AS450-1 shall be inserted into the initiator outlet port prior to firing. The air pressure going to the test fixture air cylinder shall be regulated to 61 ± 1 psig.

4.4.8.1 Torque. Measure the torque to arm each initiator upon removal from the conditioning chamber. Each initiator shall meet the requirements of 3.8.2.

4.8.2 Force. Measure the force to push the turn-push handle when tested in the test fixture, NAVSEA drawing 53711-6260971. Each initiator shall meet the requirements of 3.8.3.

4.4.9 Acceptance criteria.

4.4.9.1 Ballistic. The lot shall be acceptable if each ballistic sample meets the requirements of 3.8.

4.4.9.2 Misfire. An initiator that does not fire under the conditions specified in 4.4.8 shall be considered defective and the lot considered unacceptable, unless the misfire is clearly attributable to faulty test equipment or procedure.

4.4.9.3 Retests. There shall be no retests.

4.4.9.4 Test Failure. If the test failure is attributable to an assignable cause, excluding the test initiator, the original test results shall be discarded and that test reconducted.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of material is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES.

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. This initiator initiates the AH-64 Apache Helicopter Egress System. As it was designed specifically for use on a military helicopter, it has no commercial application.

6.2 Acquisition requirements. Acquisition documents must specify the following:

a. Title, number, and date of this specification.

b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2 and 2.3).

c. First article sample, if applicable, and test facility where sample is to be shipped for evaluation (see 3.1, 4.2 and 6.3).

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d. Packaging (see 5).

f. That the safety precaution requirements of the "Contractor's Safety Manual for Ammunition, Explosives, and Related Dangerous Material" (DOD 4145.26M) are applicable.

NOTE: When this specification is used as part of the description of work to be accomplished by a Government activity, the safety precaution requirements of Ammunition And Explosives Ashore, OP5 are applicable.

6.3 First article. When a first article inspection is required, the contracting officer should provide specific guidance to offerors whether the item(s) should be a first article sample or a sample selected from the first production items (see 3.1), and the number of items to be tested as specified in 4.2. The contracting officer should also include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results, and disposition of first articles. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract. Bidders should not submit alternate bids unless specifically requested to do so in the solicitation.

6.3.1 First article submission. A sample of 22 initiators should be subjected to first article inspection, in accordance with 4.2, when more than 12 months have elapsed since production of the latest accepted lot.

6.4 Subject term (key word) listing.

Apache
Egress
AH-64

6.5 Amendment notations. The margins of this specification are marked with vertical lines to indicate where modifications from this amendment were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations. The changes in this version were authorized by ECP 08E215J017DBR1.

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