

NOT MEASUREMENT SENSITIVE
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MIL-S-38399A(USAF)  
AMENDMENT 2  
4 August 1990  
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SUPERSEDING  
AMENDMENT 1  
1 JUNE 1978

## MILITARY SPECIFICATION

STARTER, PNEUMATIC, AIRCRAFT  
ENGINE GENERAL SPECIFICATION

This amendment forms a part of MIL-S-38399A(USAF), dated 14 February 1975, and is approved for use by the Department of the Air Force and is available for use by all Departments and Agencies of the Department of Defense.

## PAGE 1

- \* 2.1 Delete the "first sentence" and add: "Government documents."
- \* Add: 2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues 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).
- \* Under SPECIFICATIONS, Military, delete "MIL-STD-5021", "MIL-C-6021", "MIL-I-6866", "MIL-I-6868", "MIL-D-8706" entirely and add: "MIL-P-116 Preservation, Methods of".
- \* Add beneficial comments block at the bottom center of Page 1:

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Oklahoma City Air Logistics Center/MMEOR Tinker AFB OK 73145-5990 by using the Standardization Document Improvement Proposal (DD Form 1416) appearing at the end of this document or by letter.
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## PAGE 2

- \* Under STANDARDS, Military, delete "MIL-STD-100", "MIL-STD-143", "MIL-STD-480" entirety; add: "DOD-STD-100 Engineering Drawing Practices", "DOD-STD-480 Configuration Control - Engineering Changes, Deviations & Waivers", "MIL-STD-970 Standards and Specifications, Order Of Preference For The Selection Of", "MIL-STD-1595 Qualification of Aircraft, Missile and Aerospace Fusion Welders", "MIL-STD-1949 Inspection, Magnetic Particle", "MIL-STD-2073/1A DOD Materiel Procedures For Development and Application Of Packaging Requirements" and "MIL-STD-2073/2B Packaging Requirement Codes", "MIL-STD-2175 Casting, Classification and Inspection of", "MIL-STD-6866 Inspection, Liquid Penetrant", "SD-8706 General Specification For Design Examination, Engineering, Aircraft Weapon Systems."

AMSC N/A

FSC 2995

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- \* Delete the "parenthetical source statement" and add new: "(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Document Order Desk, Bldg 4D, 700 Robbins Ave, Philadelphia, PA 19111-5094)".

PAGE 3

- \* Add "2.1.2 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.

AIR FORCE SYSTEMS COMMAND DESIGN HANDBOOK

AFSC DH 1-2 General Design Factors"

- \* Add: 2.2 Non-Government publications. The following document(s) 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 D3951 Packaging, Commercial

(Application for copies should be address to: ASTM, 1916 Race St, Philadelphia, PA 19103.)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

- \* Add: 2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for related associated detail specifications, specification sheets, or MS standards), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

PAGE 4

- \* 3.2.2. Line 5 delete "MIL-D-8706" and add: "SD-8706".
- \* 3.3.1 Line 3 delete "MIL-STD-480" and add: "DOD-STD-480".
- \* 3.5 Line 3 delete "MIL-STD-143" and add: "MIL-STD-970".
- \* 3.6.1 Line 2 insert "fuel, oil, hydraulic fluid," between "to" and "combustion" and line 3 delete the word "use".
- \* 3.6.4 Delete "MIL-C-6021" and add: "DOD-STD-2175".

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- \* 3.6.6 Delete the second sentence and add new: "If used, nutrient materials and their associated fungicidal treatment shall be identified in the model specification."

PAGE 6

- \* 3.7.1.4 Insert the following first sentence "The release of sparks from the starter exhaust is permissible. Precautions in addition to the preceding that are required of the starter to prevent a hazardous condition to the aircraft shall be specified in the detail specification."

PAGE 7

- \* 3.7.3.1.a Line 3 insert the word "of" between "center" and "gravity".
- 3.7.5.3 Add the following last sentence: "Fasteners and fittings shall be in accordance with AFSC Design Handbook 1-2, Chapter 4, with the exception that Helicoil inserts will not be used in magnesium where installation and removal of the fastener are likely to occur many times during the life of the equipment."
- \* 3.7.8 Delete sentence entirety and add: "Weight. The weight of the starter, both dry weight and serviced weight, shall be specified in the model specification and shall not exceed that specified in the detail specification."
- \* 3.7.9 Delete the last sentence and add: "The location of the starter's center of gravity shall be specified on the starter vendor's outline drawing."

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- \* 3.8.1 Line 2 delete "MIL-I-6868" and add "MIL-STD-1949".
- \* 3.8.2 Line 2 delete "MIL-I-6866" and add: "MIL-STD-6866".
- \* 3.8.3 Line 2 delete "MIL-T-5021" and add: "MIL-STD-1595".
- \* 3.9.1 Line 6 insert the word "minimum" between the "period (.)" and "Factors".

PAGE 12

- 3.10.3 Insert at the beginning of first sentence: "Unless otherwise specified in the detail specification..."

PAGE 14

- 3.11.9 Delete and add: "3.11.9 Attitude
  - a. The starter shall meet the overrunning requirements of this specification in the following attitudes:
    - Continuous overrunning: 0° to 45° dive or climb combined with 10° roll in either direction.
    - Intermittent overrunning: 45° to 105° nose up position for 3 minutes, 45° to 90° nose down position for 3 minutes.

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b. The starter shall meet the starting requirements of this specification in attitudes from 0° to 45° dive combined with 10° of roll in either direction and 20° combined with 10° of roll in either direction and 20° climb combined with 10° roll in either direction."

3.12.1.1.5 Delete second, third, and fourth sentences.

PAGE 16

3.12.4 Delete the last sentence and add: "Unless otherwise specified in the detail specification the starter shall be designed for 1,000 hours of overrunning without changing or adding to the lubricant."

\* 3.13 Line 4 delete "MIL-STD-100" and add: "DOD-STD-100".

PAGE 17

\* Delete "4.1" entirety and add new: "4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in this specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements."

\* Add: "4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material."

PAGE 19

4.3.6.3 Delete and add: "4.3.6.3 Test flywheels. For the preproduction test, either a single flywheel in conjunction with a test stand loading system or two flywheels may be used for loading the starter. If the single flywheel and test stand loading system are used, both normal and rapid acceleration schedules shall be simulated. If two flywheels are used, they shall have different moments of inertia as described below and shall be referred to as flywheel A and flywheel B."

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4.4.2.1.b. Delete.

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PAGE 21

- 4.4.2.3.b. Delete "250 cycles minimum" and add "1000 cycles minimum".
- 4.4.2.3.d. Delete "250 cycles minimum" and add "1000 cycles minimum".
- 4.4.3.1 Delete last sentence and add: "Unless otherwise specified in the detail specification, the oil change interval shall not be less than 1000 hours of overrunning."

PAGE 22

- 4.4.4.b. Add to the end of the sentence: "Unless the design is changed, then 4.4.5 governs."
- 4.4.5 second line: Delete "stics".

PAGE 23

- 4.5.3 Delete the last sentence and add: "Once a lot has been rejected, full particulars concerning the cause of rejection and the action(s) necessary to check for and correct as necessary the defects in the lot shall be furnished in writing to the procuring activity."

- 4.6.5.a. Delete

PAGE 24

- 4.6.5.c. Delete "1 minute" and add: "10 seconds".
- 4.6.5.d Delete

PAGE 25

- 4.6.10 First sentence: Delete and add: "Unless otherwise specified in the detail specification, the starter shall be subjected to vibration test in accordance with MIL-STD-810, Method 514.2 equipment Category b.1 to the acceleration levels of figure 514.2-2, curve L, mounted without vibration isolators and mounted directly on the aircraft equipment that duplicates the vibration characteristics of the aircraft."

PAGE 27

- 4.6.15 Add at the end of paragraph, "During the running engagement test, one series of engagements shall be made of the following attitudes:

- 45° dive 10° left roll
- 45° dive 10° right roll
- 20° climb 10° left roll
- 20° climb 10° right roll

PAGE 28

- 4.6.18 Delete and add: "4.6.18 Clutch and shaft failure test. The starter shall be installed on a test stand with a weakened shear shaft installed. A

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start cycle shall be run that will cause the shaft to shear and the unit to shut down in its normal manner. A second start cycle shall then be performed with the shaft sheared. Any damage to the starter or the mounting pad shall be cause for rejection. If the starter incorporates an emergency disengagement feature, the following test should also be run. The starter shall be disassembled sufficiently to render the clutch inoperative. After reassembly, the output shaft shall be accelerated until the emergency disengagement feature is actuated. The starter shall then be subjected to a normal acceleration cycle with the disengagement feature actuated. Damage to the starter shall be cause for rejection."

Delete Section 5 in its entirety and add the following:

5. Packaging:

5.1 Preservation-packaging: Preservation-packaging shall be Level A, C, or Industrial as specified (see 6.2).

5.1.1 Preservation: Unless otherwise specified in the applicable contract or order, the oil used in preservation of the starter shall conform to either MIL-L-7808 or MIL-C-8188. If MIL-C-8188 is to be used, the contractor may, at his discretion, conduct the last acceptance run using undiluted MIL-C-8188 oil as the starter lubricant, after which all excess oil shall be drained. The exposed mounting flange and device shall be cleaned and coated with a light film of either MIL-L-7808 or MIL-C-8188 oil. Preservation-packaging codes in accordance with MIL-STD-2073-2B.

5.1.2. Level A: Unless otherwise specified by the contracting activity, each starter shall be individually preserved and packaged according to MIL-STD-2073-1A. The method of preservation shall conform to submethod II-A of MIL-P-116.

5.1.3 Level C: Each starter shall be preserved and packaged in a manner which will afford adequate protection against corrosion, deterioration, and physical damage during shipments from supply source to the first receiving activity for immediate use.

5.1.4 Industrial: The Industrial preservation of each starter shall be in accordance with ASTM D3951.

5.2 Packing. Packing shall be Level A, B, C, or Industrial as specified (see 6.2).

5.2.1 Level (s) A, B, or C: The level of packing shall be specified by the contracting activity. The level of packing shall be accomplished in accordance with the requirements outlined in MIL-STD-2073-1A.

5.2.2 Industrial: The packaged starter shall be packed in accordance with ASTM-D-3951.

5.3 Marking: In addition to any special marking required by the contract or order, marking shall be in accordance with MIL-STD-129.

5.4 Inspection and test: Test of methods of preservation and packaging shall be accomplished in accordance with Section 4 of MIL-P-116 to insure compliance with

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Section 5 of this specification.

Under 6. Notes add: "(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)"

PAGE 33

6.3.1 Delete and add: "6.3.1 Procuring activity. The term procuring activity as used in this specification is the agency purchasing the starter and may be other than the Government.

PAGE 35

Add: "6.3.17 Lot. A lot is a collection of units of products bearing identification and treated as a unique entity from which a sample is to be drawn and inspected to determine conformance with the acceptability criteria."

6.3.18 Failure. A failure is defined as any malfunction which requires adjustment, repair, replacement or maintenance in order to restore the starter to operational status."

Delete "6.5" entirety and add: "6.5 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of the specification.
- b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1).

"6.6 Changes from previous issue. The margins of this specification are marked with asterisks (or vertical lines) to indicate where changes (additions, modifications, corrections, deletions) from the previous issue 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 and relationship to the last previous issue.

Custodian:  
AIR FORCE -99

Preparing Activity:  
AIR FORCE -71

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