

MIL-W-9880A(USAF)

22 Feb 1971

SUPERSEDING

MIL-H-9886(USAF)

14 April 1966

## MILITARY SPECIFICATION

WIRING HARNESS, IGNITION, LOW-TENSION, REWIRABLE, AIRCRAFT  
RECIPROCATING ENGINES, GENERAL SPECIFICATION FOR

## 1. SCOPE

1.1 This specification establishes the requirements for procurement of low-tension, rewirable, ignition harnesses for aircraft reciprocating engines. The ignition harnesses shall be of one grade and shall be of the size specified herein.

## 2. APPLICABLE DOCUMENTS

- \* 2.1 The following documents of the issue in effect on date of invitation for bids or request for proposal form a part of the specification to the extent specified herein.

## SPECIFICATIONS

## Military

MIL-D-1000	Drawings, Engineering And Associated Lists
MIL-I-3190	Insulation Sleeving, Electrical, Flexible, Coated, General Specification For
MIL-C-5015	Connectors, Electric, AN Type, General Specification For
MIL-E-5272	Environmental Testing, Aeronautical And Associated Equipment, General Specification For
MIL-S-7742	Screw Threads, Standard, Optimum Selected Series: General Specification For
MIL-C-13909	Conduit, Metal, Flexible; Electrical Shielded

## STANDARDS

## Military

MIL-STD-129	Marking For Shipment And Storage
MIL-STD-130	Identification Marking Of U.S. Military Property
MIL-STD-143	Standards And Specifications, Order Of Precedence For The Selection Of
MIL-STD-794	Parts And Equipment, Procedures For Packaging And Packing Of
MIL-STD-889	Dissimilar Metals
MS3106	Connector, Plug, Electric, Straight Solder Contacts, AN Type

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MS35004	Conduit, Flexible, Radio Frequency Shielding
MS35005	Ferrule, Flexible Conduit, Radio Frequency Shielding
MS35006	Nut, Flexible Conduit, Radio Frequency Shielding

## DRAWINGS

Air Force Navy Aeronautical

AN4060

Protector - Ignition Lead Terminal

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

## 3. REQUIREMENTS

3.1 Preproduction. This specification makes provisions for preproduction testing.

3.2 Preproduction sample. A preproduction sample of the low-tension, rewirable, ignition harness shall be furnished to demonstrate the minimum acceptable standard of materials, design, workmanship, and performance specified herein. It will also be used to determine compliance with the required functional and dimensional interchangeability. (See 6.3.2)

- \* 3.3 Selection of standards and specifications. Standards and specifications for all materials, parts and Government certification and approval of processes and equipment, which are not specifically designated herein and which are necessary for the execution of this specification shall be selected in accordance with MIL-STD-143 and procedures established by the procuring activity, except as provided in 3.3.1.

- \* 3.3.1 Standard parts. Standard parts (MS, AN or JAN) shall be used wherever they are suitable for the purpose and shall be identified on the drawing by their part numbers. Commercial utility parts such as screws, bolts, nuts, et cetera, may be used, provided they possess suitable properties and are replaceable by the standard parts (MS, AN, or JAN) without alteration, and provided the corresponding standard part numbers are referenced in the parts list and, if practicable, on the contractor's drawings. In the event there is no suitable corresponding standard part in effect on date of invitation for bids, commercial parts may be used provided they conform to all requirements of this specification.

3.4 Materials. Materials shall be of the best quality, of the lightest practicable weight, and suitable for the purpose intended.

3.4.1 Metals. All metals shall be of a corrosion-resisting type.

- \* 3.4.2 Dissimilar metals. Dissimilar metals shall not be used in intimate contact with each other, unless suitably protected against electrolytic corrosion. Dissimilar metals are defined in MIL-STD-889.

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### 3.5 Design.

- \* 3.5.1 Main trunk. The main trunk of the harness shall be single conduit construction, conforming to MIL-C-13909, type 1 and shall be provided with an electrical connector conforming to MS3106 or MIL-C-5015.
- \* 3.5.2 Leads. Detachable leads shall be constructed of conduit conforming to MIL-C-13909, type 1 and conduit conforming to MS25064, and shall be provided with ferrules conforming to MS25065 and nuts conforming to MS25066, except that they shall be manufactured of stainless steel. The leads shall be provided with reinforcing bumpers on areas subject to abrasion and shall not require intermediate supporting clips. The leads shall be provided with coil outlets conforming to the engine ignition coil inlets.

3.5.3 Outlet junctions. Outlet junctions shall be provided with straight screw thread fittings conforming to MIL-S-7742 to mate with the individual lead coupling nuts and with insulation sleeving conforming to MIL-I-3190 where necessary. Outlet junctions shall include clips for attaching the harness to the engine. Outlet junctions may be detachable from the main trunk.

3.5.4 Wiring. Wiring shall be continuous from the main connector to the individual coil outlets, and shall consist of suitable insulated low-tension cable.

3.5.5 Interior. The interior surfaces shall be free from burrs or sharp edges which might cause abrasion of cable insulation, and free from obstructions.

3.5.6 End protection. Suitable electrical connector protectors conforming to AN4060 shall be provided.

3.5.7 Dimensions. Dimensions shall be as specified in Figure 1.

3.5.8 Protective covers. The main trunk and leads shall be provided with a suitable oil, gasoline, and weather resistant covering over the entire metal braided shielding surface. The covering shall provide adequate protection against chafing and abrasion when the harness is subjected to vibration.

- \* 3.6 Interchangeability. All parts having the same manufacturer's part number shall be directly and completely interchangeable with each other with respect to installation and performance. Changes in manufacturer's part numbers shall be governed by drawing number requirements of MIL-D-1000.

3.7 Maintainability. Low-tension, rewirable, ignition harness shall be so constructed as to provide for ease of maintenance and replacement.

3.8 Marking. Each low-tension, rewirable ignition harness shall be marked in accordance with MIL-STD-130. The marking shall be placed on the flats of the coupling nuts or on the main electrical connector.

3.9 Workmanship. All details of workmanship shall be in accordance with high grade practice suitable for ignition harnesses.

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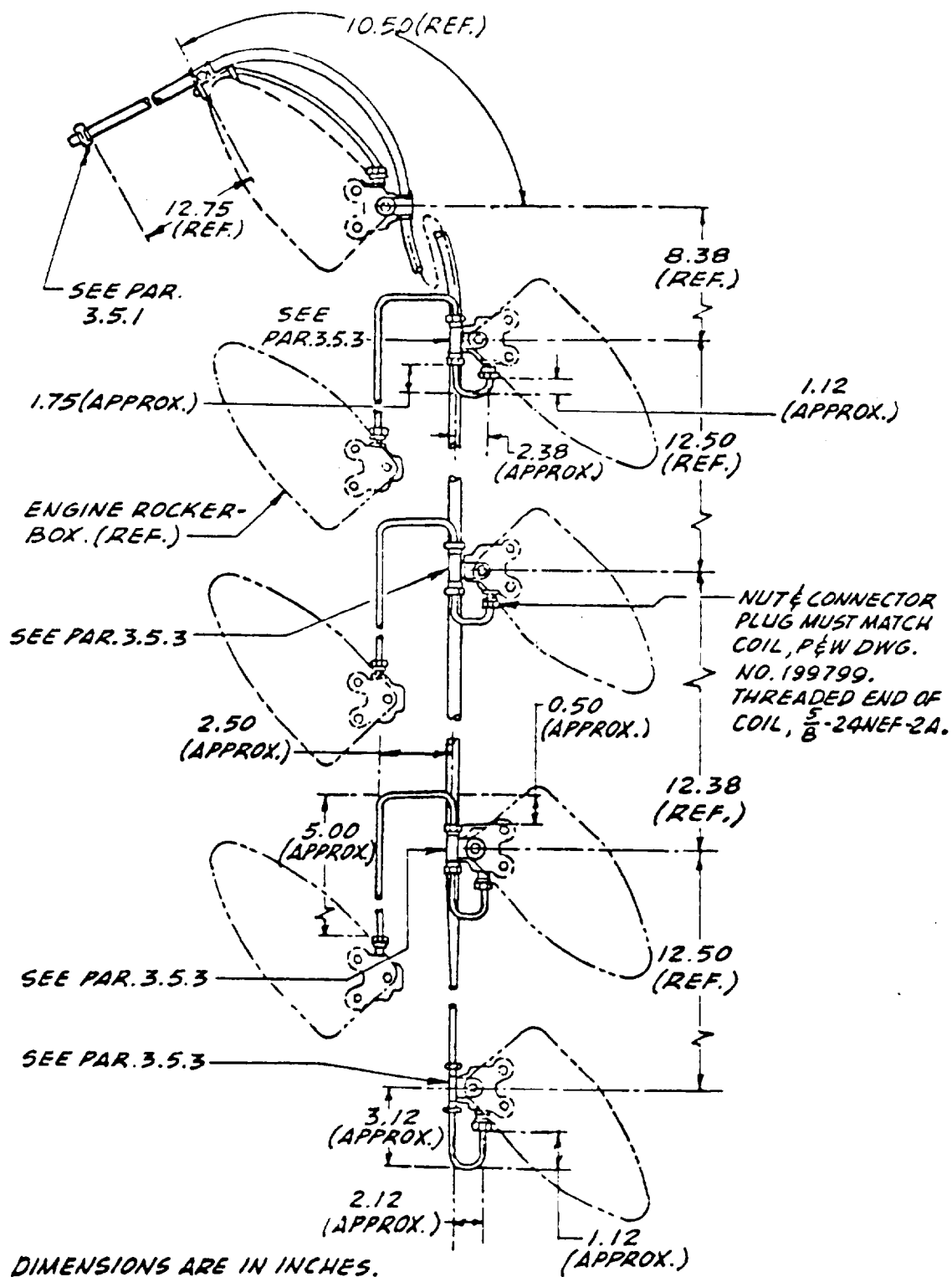


FIGURE 1. WIRING HARNESS, LOW-TENSION, REWTREABLE.

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## 4. QUALITY ASSURANCE PROVISIONS

- \* 4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier 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 the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.
- \* 4.2 Classification of tests. The inspection and testing of low-tension ignition harness shall be classified as follows:
  - a. Preproduction tests.
  - b. Quality conformance tests.
- 4.3 Preproduction testing.
  - \* 4.3.1 Preproduction test sample. Test samples shall consist of a minimum of two complete sets of harnesses to equip engines for which the harness is designed in order to conduct the tests specified in 4.3.2. Each sample will be identified as required and forwarded to the testing location designated by the procuring activity in the letter of authorization. The samples shall be plainly identified by securely attached durable tags marked with the manufacturer's name and date.
    - 4.3.1.1 Manufacturer's drawings. Two copies of manufacturer's drawings submitted with the preproduction test sample shall show a cutaway section showing all parts in their normal assembled position and shall specify part numbers of all parts and subassemblies.
    - 4.3.2 Tests. Preproduction testing of harnesses shall consist of the following:
      - 4.3.2.1 An inspection shall be performed to ascertain that the packing and marking of the harnesses conform to this specification.
      - 4.3.2.2 An inspection shall be performed by the responsible engineering activity prior to testing to ascertain that the harnesses meet the design requirements specified herein.
      - \* 4.3.2.3 All preproduction test harnesses shall be subjected to the vibration test specified in 4.4.4.
    - \* 4.3.3 Rejection and retest. Failure of any harness to conform to any one of the requirements of this specification shall be cause for disapproval. Electrical or structural failure of any one of the test harnesses shall also be cause for disapproval unless the failure was due to mishandling. Anytime a harness is disapproved, the manufacturer may withdraw his product, remedy the deficiency and resubmit his product. After correction, all of the tests shall be repeated.

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- \* 4.4 Quality conformance tests. Quality conformance test shall consist of the following:
  - \* 4.4.1 Individual tests. Each harness shall be individually subjected to the following tests.
  - \* 4.4.2 High potential test. Each harness shall be subjected to a high potential test of 1000 volts alternating current root mean square (rms) for every circuit to every other circuit, and every circuit to ground.
  - \* 4.4.3 Leakage test. Each harness shall be subjected to a leakage test at 1000 volts direct current (DC) for every circuit to every other circuit, and every circuit to ground. Current leakage shall reflect a minimum leakage of one megohm.
  - \* 4.4.4 Vibration test. Each harness shall be subjected to Procedure XII of MIL-E-5272.
- \* 4.5 Inspection of preservation, packaging, packing and marking for shipment and storage. Sample items or packs and the inspection of the preservation, packaging, packing and marking for shipment and storage shall be in accordance with the requirements of Section 5, or the documents specified therein.

## 5. PREPARATION FOR DELIVERY

- \* 5.1 Packaging. Packaging shall be level A or C (see 6.2) in accordance with MIL-STD-794.
- \* 5.2 Packing. Packing shall be level A, B, or C (see 6.2) in accordance with MIL-STD-794.
- \* 5.3 Marking. In addition to any special marking required by the contract or order, interior packages and shipping containers shall be marked in accordance with MIL-STD-129.

## 6. NOTES

6.1 Intended use. Low-tension, rewirable, ignition harnesses are intended for use with aircraft engine ignition systems as completely rewirable and field serviceable ignition harnesses.

- \* 6.2 Ordering data. Procurement documents should specify the following:
  - a. Title number, and date of specification.
  - b. Manufacturer's name.
  - c. Manufacturer's part number.
  - d. Name of contractor (if different than manufacturer).
  - e. Selection of applicable level of packaging and packing (see 5.1 and 5.2).

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6.3 Provisions for preproduction tests. With respect to products requiring testing, awards will be made only for such products as have been tested and approved prior to the bid opening date.

6.3.1 The attention of suppliers is called to this requirement, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government preproduction tested in order that they may be eligible to be awarded contracts or orders for the products covered by this specification.

6.3.2 It is to be understood that samples shall be furnished at no cost to the Government, and that the manufacturer shall pay all transportation charges to and from the point where the tests are made. In the case of failure of the sample or samples submitted, evaluation will be performed by the responsible engineering activity, and samples returned to the manufacturer. Consideration will be given to the request of the manufacturer for additional tests only after it has been clearly shown that changes have been made in the product which the responsible engineering activity considers sufficient to warrant additional tests.

6.3.3 It is to be understood that low-tension, rewirable, ignition harnesses supplied under contract shall be identical in every respect to the sample tested and found satisfactory, except, for changes previously approved by the responsible engineering activity. Any unapproved changes from the preproduction sample shall constitute cause for rejection.

\* 6.4 The margins of this specification are marked with an asterisk 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 - 82

Preparing Activity:  
Air Force - 82

Review Activity:  
Air Force - 82

Project No. 2925-F043

SPECIFICATION ANALYSIS SHEET		Form Approved Budget Bureau No. 22-R255
<p><b>INSTRUCTIONS:</b> This sheet is to be filled out by personnel, either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity. Comments and suggestions submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or serve to amend contractual requirements.</p>		
SPECIFICATION		
ORGANIZATION		
CITY AND STATE	CONTRACT NUMBER	
MATERIAL PROCURED UNDER A <input type="checkbox"/> DIRECT GOVERNMENT CONTRACT <input type="checkbox"/> SUBCONTRACT		
1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE? A. GIVE PARAGRAPH NUMBER AND WORDING.		
B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES		
2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID		
3. IS THE SPECIFICATION RESTRICTIVE? <input type="checkbox"/> YES <input type="checkbox"/> NO (If "yes", in what way?)		
4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)		
SUBMITTED BY (Printed or typed name and activity - Optional)		DATE



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