

Issued 2000-11
Cancelled 2006-06

Superseding AS26780

Tie Down, Cargo, Aircraft, Nylon Web Net

RATIONALE

AS26780 was returned to military custody as MIL-T-26780C at their request. Accordingly, it is hereby cancelled as regards SAE.

CANCELLATION NOTICE

This document has been declared "CANCELLED" as of June 2006. By this action, this document will remain listed in the Numerical Section of the Aerospace Standards Index.

SAENORM.COM : Click to view the full PDF of as26780a

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2006 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of SAE.

TO PLACE A DOCUMENT ORDER: Tel: 877-606-7323 (inside USA and Canada)
Tel: 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: <http://www.sae.org>

**SAE values your input. To provide feedback
on this Technical Report, please visit
<http://www.sae.org/technical/standards/AS26780A>**

SAE AS26780 Revision A

NOTICE

This document has been taken directly from U.S. Military Specification MIL-T-26780C, Amendment 1, Notice 1 and contains only minor editorial and format changes required to bring it into conformance with the publishing requirements of SAE technical standards. The initial release of this document is intended to replace MIL-T-26780C, Amendment 1, Notice 1. Any part numbers established by the original specification remain unchanged.

The original Military Specification was adopted as an SAE standard under the provisions of the SAE Technical Standards Board (TSB) Rules and Regulations (TSB 001) pertaining to accelerated adoption of government specifications and standards. TSB rules provide for (a) the publication of portions of unrevised government specifications and standards without consensus voting at the SAE Committee level, and (b) the use of the existing government specification or standard format.

Under Department of Defense policies and procedures, any qualification requirements and associated qualified products lists are mandatory for DOD contracts. Any requirement relating to qualified products lists (QPL's) has not been adopted by SAE and is not part of this SAE technical document.

SAENORM.COM : Click to view the full PDF of as26780a

SAE AS26780 Revision A

1. SCOPE:

1.1 Scope:

This specification covers two types of aircraft cargo tie downs, each having a capacity of 10,000 pounds.

1.2 Classification:

The tiedowns shall be of the following types as specified (see 6.2).

Type MA-2, 15 by 15 feet
Type MA-3, 20 by 20 feet

1.3 Part number:

Specification part number for items described in this document will be formulated as shown in Section 6.4.

2. APPLICABLE DOCUMENTS:

2.1 Government documents:

2.1.1 Specification and standards: Unless otherwise specified (see 6.2), the following specifications and standards of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation, form a part of this specification to the extent specified herein.

SPECIFICATIONS

FEDERAL

V-T-295	Thread, Nylon
PPP-B-601	Boxes, Wood, Cleated-Plywood
PPP-B-636	Box, Shipping, Fiberboard
PPP-T-45	Tape, Gummed, Paper, Reinforced and Plain, for Sealing and Securing

MILITARY

MIL-P-116	Preservation, Methods of
DOD-D-1000	Drawing, Engineering and Associated List
MIL-W-4088	Webbing, Textile, Woven Nylon
MIL-W-27265	Webbing, Textile, Woven Nylon, Impregnated

SAE AS26780 Revision A

2.1.1 (Continued):

STANDARDS

MILITARY

MIL-STD-129	Marking For Shipment And Storage
MIL-STD-130	Identification Marking Of US Military Property
MIL-STD-143	Standards And Specifications, Order Of Precedence For The Selection Of
MIL-STD-810	Environmental Test Methods
MIL-STD-831	Test Reports, Preparation Of
MIL-STD-849	Inspection Requirements, Definitions And Classification Requirements, Definitions And Classification Of Defects For Parachutes
MIL-STD-889	Dissimilar Metals
MIL-STD-1186	Cushioning, Anchoring, Bracing, Blocking, And Waterproofing With Appropriate Test Methods

(Copies of specifications and standards required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

3. REQUIREMENTS:

3.1 First article testing:

The tie downs furnished under this specification shall be subjected to first article tests (see 4.4.1).

3.2 Components:

The tie down shall consist of nylon webbing and hardware. The hardware shall consist of reefing rings and hooks, fixed attachment hooks, and adjustable attachment hooks having an adjusting, a tensioning, and a releasing mechanism.

3.3 Selection of specifications and standards:

Specifications and standards for necessary commodities and services not specified herein shall be selected in accordance with MIL-STD-143 except as specified in 3.3.1.

3.3.1 Commercial parts: Commercial parts having suitable properties may be used where, on the date of invitation for bids, there are no suitable standard parts. In any case, commercial utility parts, such as snaps, rings, hooks, and rivets, having suitable properties may be used provided:

- a. They can be replaced by the AN or MS standard parts without alteration.
- b. The corresponding standard part numbers are referenced in the parts list and, if practical, on the contractor's drawings.

SAE AS26780 Revision A

3.4 Materials:

3.4.1 Fungus proof materials: Materials that are nutrients for fungi shall not be used where it is practical to avoid them. Where used, they shall be treated with a fungicidal agent acceptable to the procuring activity.

3.4.2 Metals: Metals shall be of the corrosion resistant type or suitably treated to resist corrosion due to salt spray or atmospheric conditions that may be encountered in storage or normal service.

3.4.2.1 Dissimilar metals: Unless suitably protected against electrolytic corrosion, dissimilar metals shall not be used in intimate contact with each other. Dissimilar metals are defined in MIL-STD-889.

3.4.2.2 Reclaimed materials: The use of reclaimed materials shall be encouraged to the maximum extent possible.

3.5 Design and construction:

The tie down shall be designed and constructed so that no parts will work loose in service. It shall be built to withstand the strains, jars, vibrations, and other conditions incident to shipping, storage, installation, and service. The tie down shall be constructed essentially in accordance with Figure 1.

3.5.1 Operation: Attachment hooks and operating mechanisms shall be so designed and constructed that they can be easily operated in confined areas and under extreme temperature conditions by personnel wearing heavy gloves. Webbing shall not interfere with the operation and locking of the tensioning lever.

3.5.2 Stowage: The tie down shall be designed to fold into a compact unit to occupy the least possible space when stowed. Stowage of the tie down shall be possible for one person to accomplish in approximately 2 minutes.

3.6 Performance:

3.6.1 Proof load: The 3,600 pound webbing and hardware shall withstand a proof load of 1,500 pounds applied for 30 seconds without evidence of damage to the webbing, sewing, and metal parts; permanent deformation of the metal parts; or slippage of the webbing through the adjustable attachment hook. The 6,500 pound webbing and hardware shall withstand a proof load of 2,600 pounds applied for 30 seconds without evidence of damage to the webbing, sewing, and metal parts; permanent deformation of the metal parts; or slippage of the webbing through the adjustable attachment hook.

SAE AS26780 Revision A

3.6.2 Ultimate load: The 3,600 pound webbing and hardware shall withstand an ultimate load of 3,000 pounds applied for 30 seconds without failure or slippage of the webbing or failure of sewing or metal parts. Damage such as broken sewing thread without complete separation, broken or frayed webbing without complete separation of the webbing, and deformation but not rupture of the hardware shall be permitted. The 6,500 pound webbing and hardware shall withstand an ultimate load of 5,000 pounds applied for 30 seconds without failure or slippage of the webbing or failure of the metal parts. The releasing mechanism shall be operable after application of each of the ultimate loads specified.

3.6.3 Environmental characteristics: The tie down shall be capable of operating satisfactorily under the following conditions:

- a. Exposure to atmosphere containing salt laden moisture for 50 hours.
- b. Sand and dust particles as encountered in desert areas.
- c. Vibration incident to use in aircraft when tested as specified in Section 4.

3.7 Webbing:

The webbing shall consist of 3,600 and 6,500 pound webbing conforming to MIL-W-4088, treated Class L of MIL-W-27265. All webbing shall be cut with a hot knife or seared to prevent fraying. The color of the webbing shall be olive drab, Number 7, as specified in MIL-W-4088.

3.7.1 Sewing: Suggested stitching designs are shown on Figure 2; however other stitching designs may be selected by the manufacturer provided these designs meet the requirements of this specification. All thread shall be in accordance with V-T-295. A minimum of 3 ply thread shall be used.

3.7.2 Webbing stops: The ends of webbing which pass through the adjustable hooks shall be provided with a stop. Webbing may be folded and tacked or may include hardware. A minimum of two (2) folds are required where webbing is folded.

3.7.3 Mesh: The mesh shall be constructed of 3,600 and 6,500 pound webbing in accordance with Figure 1. The distance between webbing centers shall be 10 inches. The four corners of the mesh shall incorporate suitable rings as shown on Figure 1.

SAE AS26780 Revision A

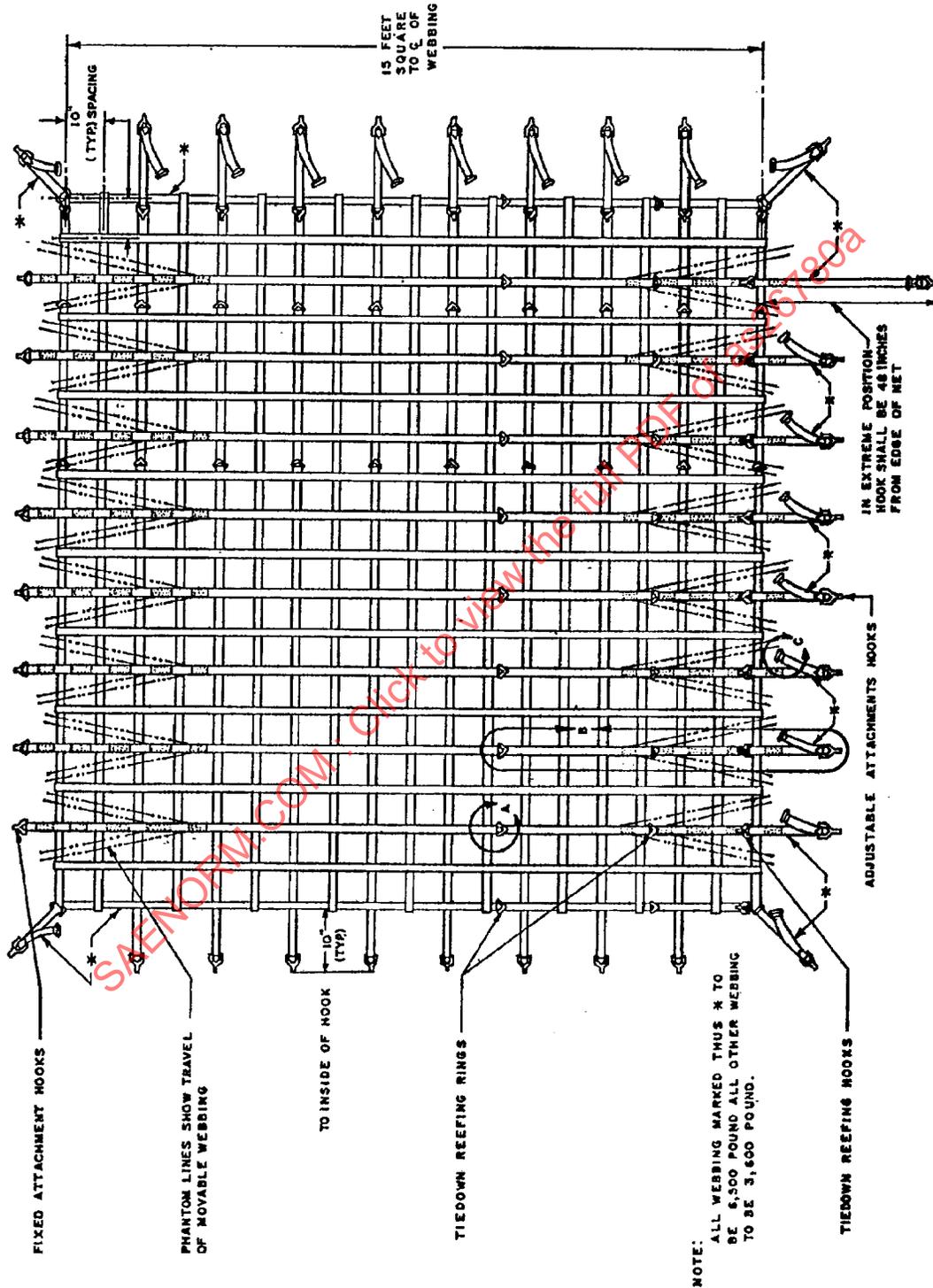


Figure 1

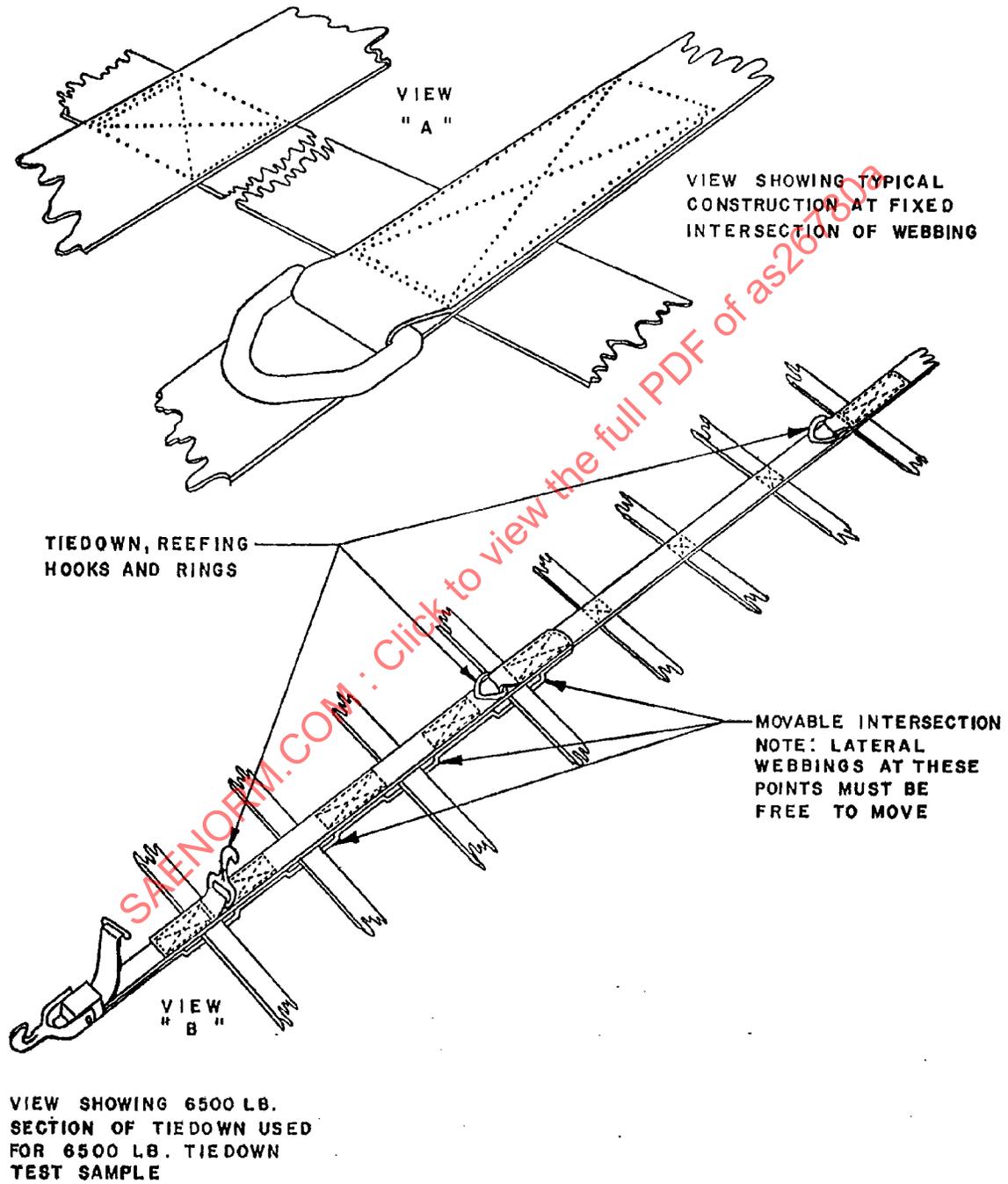


Figure 2.

SAE AS26780 Revision A

3.8 Hardware:

All hardware shall be securely sewed to the webbing or otherwise attached to the tie down to preclude loss of the hardware. All hardware shall be installed essentially in accordance with Figure 1.

3.8.1 Reefing rings and hooks: The mesh shall incorporate two fixed increment adjustments so that the mesh can be reefed on two sides. The adjustment shall be accomplished by means of suitable reefing rings and hooks with keepers located on the adjustable hook side of the tie down as shown in Figure 1.

3.8.2 Attachment hooks: Hooks used to attach the tie down to the aircraft tie down fittings shall be designed for rapid attachment without special manual manipulation or the use of tools. The design of the hooks shall be such that the hooks shall be capable of securing the tie down to a ring having a minimum clear opening of 3/4 inch diameter and a maximum cross sectional diameter of 7/8 inch.

3.8.2.1 Fixed hooks: Two adjacent sides of the tie down shall be provided with fixed swiveling or nonswiveling hooks equipped with keepers to prevent them from disengaging from the tie down fitting in the aircraft.

3.8.2.2 Adjustable hooks: The two remaining sides of the tie down and the four corners shall be provided with adjustable nonswiveling hooks without keepers. Each adjustable hook shall incorporate a tensioning, an adjusting, and a releasing mechanism. Any mechanism which is designed in such a manner that it is a hazard to personnel operating the mechanism shall not be acceptable.

3.8.2.2.1 Tensioning mechanism: After preliminary adjustment of the webbing to remove excess slack, the tensioning mechanism shall be capable of applying, by manual operation, a tension to the webbing of not less than 150 pounds with an applied force of not more than 50 pounds. The tensioning mechanism shall be either a single action, over center tensioning mechanism or a progressive takeup ratchet tensioning mechanism. After tensioning, the mechanism lever shall not protrude and thus present a hazard to personnel moving about in the aircraft. If a ratchet type mechanism is used, no more than six progressive takeups of the mechanism shall be required to obtain 150 pounds of tension, and the mechanical advantage of the mechanism shall not exceed four. The lever shall not be designed in any way which will facilitate the use of such an item as a pipe or bar to increase the effective length of the lever and hence the mechanical advantage of the mechanism. Knurled surfaces which come in contact with the webbing shall not be employed on either type of mechanism. A positive type lock shall be incorporated in the tensioning mechanism. This lock shall automatically engage upon completion of the tensioning operation. A force of not more than 5 pounds shall be required to disengage the lock. An additional operation as specified in 3.8.2.2.3 may be required to permit slack in the webbing.

3.8.2.2.2 Adjusting mechanism: An adjusting mechanism shall be provided which shall make it possible to slide and lock the adjustable hook to any position on the webbing where it is attached. Methods of adjustment in fixed increments shall not be acceptable.

SAE AS26780 Revision A

3.8.2.2.3 Releasing mechanism: A releasing mechanism shall be provided which shall be capable of introducing sufficient slack in the webbing to permit instant removal of the attachment hooks without further adjustment. The force required to manually release a tension load of 225 pounds shall not exceed 75 pounds.

3.9 Interchangeability:

All parts having the same manufacturer's part number shall be functionally and dimensionally interchangeable. The item identification and part number requirements of DOD-D-1000 shall govern the manufacturer's part numbers and changes thereto.

3.10 Dimensions:

Dimensions and tolerances not specified shall be as close as is consistent with the best commercial practices. Where dimensions and tolerances may affect interchangeability, operation, or performance of the tie down, they shall be held or limited accordingly. The Type MA-2 tie down shall be 15 by 15 feet and shall conform to Figure 1. The Type MA-3 tie down shall be 20 by 15 feet with the 6,500 pound webbing running in the longer dimension.

3.11 Weight:

The total weight of the Type MA-2 tie down shall not exceed 95 pounds and the Type MA-3 tie down shall not exceed 120 pounds.

3.12 Identification of product:

Equipment, assemblies, and parts shall be marked for identification in accordance with MIL-STD-130.

3.13 Workmanship:

The tie down, including all parts and accessories, shall be fabricated and finished in a thoroughly workmanlike manner. Particular attention shall be given to the following:

- a. Freedom from defects, burrs, sharp edges, and other protrusions which may damage the webbing. Corners shall be rounded.
- b. Accuracy of dimensions and marking of parts and assemblies.
- c. Thoroughness of riveting.
- d. Alignment of parts and tightness of assembly screws and bolts.

SAE AS26780 Revision A

- e. Completeness of stitching.
- f. Freedom of movable webbing.

4. QUALITY ASSURANCE PROVISIONS:

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 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 otherwise 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 tie downs shall be classified as follows:

- (1) First Article (see 4.4)
- (2) Acceptance Testing (see 4.5)
- (3) Test Methods (see 4.6)
- (4) Inspection of Packaging (see 4.7)

4.3 Test conditions:

The test conditions are described under the individual tests to which they apply.

4.4 First article examination and testing:

- 4.4.1 Test samples: One complete tie down representative of the production tie down and six tie down webbing samples, fabricated by the same procedure and, using the same equipment used to produce the complete tie down, shall be subjected to all the tests described under 4.6. Three of these samples shall incorporate 6,500 pound webbing and shall consist of the section of the tie down shown on Figure 2, View B, without the loose lateral webbing in the movable webbing intersection. The lateral webbing in the fixed webbing intersections of each sample shall extend at least 5 inches on each side of the webbing intersection. Three remaining samples shall incorporate 3,600 pound webbing and shall also be the same as Figure 2, View B, except that all webbing intersections shall be fixed intersections. A fixed attachment hook shall be sewed to the free end of the sample. Samples shall be appropriately identified by manufacturer's part numbers and any additional information required by the letter of authorization.
- 4.4.2 Test report: Upon completion of first article testing, the contractor shall submit a test report prepared in accordance with MIL-STD-831.

SAE AS26780 Revision A

4.5 Acceptance tests:

Acceptance tests shall consist of the following:

- a. Individual tests.
- b. Sampling plan and tests.

4.5.1 Individual tests: Each tie down shall be subjected to an examination of product as specified in 4.6.1.

4.5.2 Sampling plan: After every 25 tie downs or fraction thereof produced, 6 tie down test samples (see 6.3.2) shall be fabricated using the same equipment and procedure used to produce the complete tie down. The tie down test samples shall be selected as specified in 4.4.1 and subjected to the ultimate load test specified in 4.6.3.4.

4.5.2.1 Rejection and retest: When one tie down test sample selected from a production run fails to meet the specification, no tie downs still on hand or later produced shall be accepted until the extent and cause of failure are determined and appropriately corrected. The contractor shall explain to the Government representative the cause of failure and the action taken to preclude recurrence. After correction, all the tests shall be repeated.

4.5.2.2 Individual test may continue: For operational reasons, individual tests may be continued pending the investigation of a sampling test failure. Final acceptance of tie downs on hand or produced later shall not be made until it is determined that they meet all the requirements of the specification.

4.5.3 Defects in tie downs already accepted: The investigation of a sampling test failure could indicate that defects may exist in tie downs already accepted. If so, the contractor shall fully advise the procuring activity of all defects likely to be found and methods of correcting them.

4.6 Test methods:

4.6.1 Examination of product: Tie downs shall be examined in accordance with MIL-STD-849, Table II, Item 6, and Tables IX and X to determine compliance with the requirements specified herein with respect to material, weight and workmanship.

4.6.2 Environmental tests: The tie down test samples shall be subjected to the following environmental tests performed in accordance with the specified procedures of MIL-STD-810.

4.6.2.1 Salt spray: One 6,500 and one 3,600 pound tie down test sample shall be subjected to a salt spray test in accordance with procedure II. Upon completion of this test, the test samples shall meet the requirements of 3.5.1, 3.8.2.2.1, 3.8.2.2.2 and 3.8.2.2.3.