MIL-D-7890A(ASG)
9 May 1968

Superseding
MIL-I-7890
29 February 1952

MILITARY SPECIFICATION

DESIGN AND INSTALLATION OF ANTI-G SUIT PRESSURE SYSTEMS IN JET PROPELLED AIRCRAFT

This specification has been approved by the Department of the Air Force and by the Naval Air Systems Command.

1. SCOPE

1.1 This specification covers the design and installation of anti-G suit pressure systems in jet-propelled aircraft.

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 this specification to the extent specified herein:

SPECIFICATIONS

Federal

BB-N-411	Nitrogen, Technical
WW-T-700	Tube, Aluminum Alloy, Drawn, Seamless; General Specification for

Military

MIL-L-25567	Leak Detection Compound, Oxygen Systems
MIL-H-26385	Hose, Oxygen and Pressurization, Ozone Resistant

STANDARDS

Military

MIL-STD-101	Color Code for Pipelines and for Compressed Gas Cylinders
MIL-STD-143	Specifications and Standards, Order of Precedence for the Selection of
MS22064	Clamp, Oxygen Hose
MS24350	Valve, Automatic Regulating Pressure, Anti-G
MS33658	Fitting End, Hose Connection, Standard Dimensions for
AN6532	Connector, Assembly, Hose, Quick Acting, Female, Anti-G Suit Use
AND10059	Fittings - Styles of Pipe Threaded, Flared Tube and Hose

(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 Materials.-

3.1.1 Selection of materials.- Specifications and standards for materials, parts, and processes not specified herein shall be selected in accordance with MIL-STD-143.

3.1.2 Metal tubing.- Metal tubing shall be 5/8 inch outside diameter and shall conform to WW-T-700.

3.1.3 Fittings.- Fittings shall be in accordance with AND10059.

3.1.4 Hose.- Unless otherwise specified herein, all hose shall be 5/8 inch inside diameter conforming to MIL-H-26385. A clamp in accordance with MS22064 shall be used to secure each end of the hose to the associated fitting.

3.2 Design.- The anti-G suit pressure system shall be designated to provide pressurization for an anti-G-suit, using the aircraft engine compressor as a source of regulated air pressure. The installation shall comprise tubing, fittings, hose, valves, connections, and any other items necessary for the anti-G suit pressure system.

3.3 Installation.-

3.3.1 System plumbing.- Metal tubing shall be used in the system plumbing from the air source to the regulating valve except where flexibility is required for installation or removal of equipment. Where flexibility is required, a hose of the minimum length necessary shall be used. Tubing shall not be installed in an area of the aircraft which will be subjected to a temperature of 350° F or greater. Use of hose is limited to areas of the aircraft which do not exceed 160° F.

3.3.2 Regulating valve.- An anti-G valve conforming to MS24350 shall be installed for each crew member of the aircraft. In single-place and tandem-seat aircraft, the anti-G valve shall be located in the aft portion of the left console, adjacent to the seat, within reach of the crew member. For side-by-side seating, the anti-G valve for the left seat shall be located as specified for a single-place aircraft. For side-by-side seating, the anti-G valve for the right seat shall be located in the aft portion of the center console, adjacent to the seat, within reach of the crew member. The valve shall be mounted so that the pressure regulating unit is vertical and is perpendicular to the horizontal plane of flight of the aircraft.

3.3.3 Ejection seat plumbing.- Metal tubing shall be used in the plumbing from the regulating valve to the ejection seat or seat kit disconnect, except where flexibility is required for installation or removal of equipment or for seat adjustment. Where flexibility is required, a hose of the minimum length necessary shall be used.

3.3.3.1 Disconnect.- A disconnect shall be provided either on the left rear portion of the ejection seat or in the left rear portion of the seat kit. The disconnect shall permit separation of the seat from the aircraft portion of the anti-G suit pressure system automatically upon ejection from the aircraft. The inlet and the outlet fittings of the disconnect shall conform to MS33658-10.

3.3.3.2 Personnel services.- Personnel services shall be provided, using a hose from the top of the disconnect to a connector conforming to AN6532. The hose length shall permit the user's movement during his normal duties at his station and shall not provide excessive length with resultant bulkiness.

3.3.4 Capsule plumbing.- A hose shall be provided from a terminal point at the left rear of the seat to a connector conforming to AN6532. The hose length shall permit the user's movement during his normal duties at his station and shall not provide excessive length with resultant bulkiness. Metal tubing shall be used in the plumbing from the regulating valve to the terminal point, except where flexibility is required for installation or removal of equipment. Where flexibility is required, a hose of the minimum length necessary shall be used.

3.4 Performance.-

3.4.1 System functional performance.- When tested as specified in 4.5.2, the anti-G suit pressure system shall provide, to the regulating valve, an air flow of at least 500 liters per minute at a temperature not greater than 400° F. and at a pressure of 125 ±5 pounds per square inch gage. Contamination of the system shall not exceed 1-ounce increase in filter weight.

3.4.2 Leakage.- When tested as specified in 4.5.3, the anti-G suit pressure system shall not leak.

3.5 Identification marking.- The plumbing of the anti-G suit pressure system shall be marked for identification in accordance with MIL-STD-101.

3.6 Workmanship.- The anti-G suit pressure system shall be uniform in quality and shall be free from irregularities, defects, or foreign matter which could adversely affect safety, performance, reliability, or durability.

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, the

supplier may utilize his own facilities or any commercial laboratory acceptable to 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 inspection.- The examination and testing of the anti-G suit pressure system shall be classified as quality conformance inspection.

4.3 Quality conformance inspection.- The quality conformance inspection shall consist of all the examinations and tests in this specification and shall be conducted on each anti-G suit pressure system to determine its conformance to the requirements specified herein.

4.4 Test conditions.-

4.4.1 Temperature and pressure.- Unless otherwise specified, tests shall be conducted at local ambient temperature and barometric pressure. The temperature and the barometric pressure shall be recorded at the time of inspection. This information shall be available for computation of test data, where required, to normal temperature and pressure conditions. The normal temperature and pressure conditions are 29.92 inches of mercury and 70° F. Test instruments shall be calibrated or adjusted according to their required usage in conducting individual tests.

4.4.2 Leak test compound.- The leak detection compound employed in testing the anti-G suit pressure system shall conform to MIL-L-25567. Care shall be exercised to remove all traces of leak testing material from the plumbing after all leakage tests.

4.4.3 Gas.- The pressurized gas used in testing the anti-G suit pressure system shall be either water-pumped nitrogen conforming to type I, class 1, grade B of BB-N-411 or compressed air equivalent in dryness to the nitrogen specified herein.

4.5 Inspection methods.-

4.5.1 Visual examination.- The anti-G suit pressure system shall be examined to determine conformance to this specification and applicable drawings with respect to all the requirements not covered by tests.

4.5.2 System functional test.- The plumbing of the anti-G suit pressure system shall be disconnected from the inlet of the regulating valve; appropriate flow, pressure, and temperature measuring equipment shall be connected to the system plumbing. The aircraft engine shall then be operated at rated power; measurements of flow, pressure, and temperature shall be made. After completion of this test, a suitable molecular sieve filter shall be attached to the system plumbing so that the full flow passes through the filter for at least 30 minutes. Difference in filter weight, before and after flow, shall be determined.

4.5.3 Leakage.- The plumbing of the anti-G suit pressure system shall be disconnected at the aircraft engine compressor, and a gaseous pressure of 300 pounds per square inch gage shall be applied to the anti-G suit pressure system. Under these conditions, all fittings and hose connections shall be checked for leakage, using leak detection compound.

5. PREPARATION FOR DELIVERY

Not applicable.

6. NOTES

6.1 Intended use.- The installation requirements specified herein are intended for use in designing and installing anti-G suit pressure systems in jet-propelled fighter and trainer aircraft.

6.2 Ordering data.- Procurement documents should specify:

(a) Title, number, and date of this specification.
(b) Data required (see 6.3).

6.3 Data.- For the information of contractors and contracting officers, any of the data specified in (a) 6.3.1 of this specification, (b) applicable documents listed in section 2 of this specification, or (c) referenced lower-tier documents need not be prepared for the Government and shall not be furnished to the Government unless specified in the contract or order. The data to be furnished to the Government will be listed on DD Form 1423 (Contractor Data Requirements List) or NavWeps Form 4200/15 (Drawings, Lists, and Specifications Required) which will be attached to and made a part of the contract or order.

6.3.1 Drawings.- Drawings should include the following and shall be in accordance with MIL-STD-100:

(a) At least 60 days prior to the preparation of the drawings covering the installation of the anti-G suit pressure system, a schematic diagram of the anti-G suit pressure system shall be submitted to the procuring activity. The schematic diagram shall include the description of the relative location of the regulating valves.
(b) All drawings covering the installation of the anti-G suit pressure system shall be submitted to the procuring activity for approval. The drawings shall show the position of the anti-G suit pressure system in the aircraft and the position of the regulating valves in relation to the crew members' seats.

6.4 International standardization agreement.- Certain provisions of this specification which pertain to anti-G protection performance are the subject of international standardization agreement STANAG No. 3200. When amendment, revision,

or cancellation of this specification is proposed, the departmental custodians will inform their respective Departmental Standardization Offices so that appropriate action may be taken respecting the international agreement concerned.

Custodian:
Air Force - 11

Reviewer activities:
Navy - AS
Air Force - 11, 71

International interest (see 6.4)

Preparing activity:
Air Force - 11

Project No. 1660-F004

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1. DOCUMENT NUMBER	2. DOCUMENT TITLE
MIL-D-7890A(AS)	DESIGN AND INSTALLATION OF ANTI-G SUIT PRESSURE SYSTEMS

3a. NAME OF SUBMITTING ORGANIZATION	4. TYPE OF ORGANIZATION *(Mark one)*
	☐ VENDOR
b. ADDRESS *(Street, City, State, ZIP Code)*	☐ USER
	☐ MANUFACTURER
	☐ OTHER *(Specify)*:

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional	b. WORK TELEPHONE NUMBER *(Include Area Code)* – Optional
c. MAILING ADDRESS *(Street, City, State, ZIP Code)* – Optional	8. DATE OF SUBMISSION *(YYMMDD)*

DD FORM 82 MAR 1426

PREVIOUS EDITION IS OBSOLETE.

(TO DETACH THIS FORM, CUT ALONG THIS LINE.)