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MIL-V-85830(AS)
6 November 1989

MILITARY SPECIFICATION

VENTILATOR, TACTICAL, HELICOPTER AIRCREWMAN, CHEMICAL, BIOLOGICAL, RADIOLOGICAL PROTECTIVE

This specification is approved for use within the Naval Air 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 establishes the requirements for the manufacture and acceptance of a ventilator to be used with and form part of the Protective Assembly, Helicopter Aircrewman, Chemical, Biological Radiological (PASS).

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards and handbooks. The following specifications, standards, and handbooks form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

FEDERAL

PPP-B-636 - Box, Shipping, Fiberboard

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commanding Officer, Naval Air Engineering Center, Systems Engineering and Standardization Department (Code 53), Lakehurst, NJ 08733-5100, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 4240

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SPECIFICATIONS

FEDERAL (cent'd)

PPP-C-795	Cushioning Material, Flexible, Cellular, Plastic Film for Packaging Applications
PPP-C-1842	Cushioning Material, Plastic, Open Cell (For Packaging Applications)

MILITARY

MIL-B-18	Batteries, Non-Rechargeable, Dry.
MIL-P-116	Preservation, Methods of.
MIL-B-117	Bags, Sleeves and Tubing - Interior Packaging.
MIL-E-5400	General Specification for Aerospace Electronic Equipment.
MIL-A-8625	Anodic Coatings for Aluminum and Aluminum Alloys.
MIL-14-16878	Wire, Electrical, Insulated, General Specification for.
MIL-N-18307	Nomenclature and Identification for Aeronautical Systems Including Joint Electronics Type Designated Systems and Associated Support Systems
MIL-P-28809	Printed Wiring Assemblies.
MIL-B-49430	Battery, Non Rechargeable, Lithium Sulfur Dioxide.
MIL-P-55110	Printed Wiring Boards.
MIL-C-85829	Coupling Assembly, Hose, Chemical, Biological, Radiological Protective.
MIL-P-85833	Protective Assembly, Helicopter Aircrewman, Chemical, Biological, Radiological.

STANDARDS

FEDERAL

FED-STD-595	Colors.

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STANDARDS

MILITARY

DOD-STD-100	Engineering Drawing Practices.
MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-129	Marking for Shipment and Storage.
MIL-STD-130	Identification Marking of U.S. Military Property.
MIL-STD-143	Order of Precedence for the Selection of Standards and Specifications.
MIL-STD-210	Climatic Extremes for Military Equipment.
MIL-STD-282	Filter Units, Protective Gas Mask Components and Related Products, Performance Test Methods.
MIL-STD-454	Standard General Requirements for Electronic Equipment.
MIL-STD-461	Electromagnetic Emmission and Susceptibility Requirements for the Control of Electromagnetic Interference.
MIL-STD-462	Measurement of Electromagnetic Interference Characteristics.
DOD-STD-480	Configuration Control - Engineering Changes, Deviations and Waivers.
MIL-STD-483	Configuration Management Practices for Systems, Equipment, Munitions and Computer Programs.
MIL-STD-490	Specification Practices.
MIL-STD-781	Reliabillty Design and Production Acceptance Tests: Exponential Distribution.
MIL-STD-794	Parts and Equipment, Procedures for Packaging and Packing of.
MIL-STD-810	Environmental Test Methods and Engineering Guidelines.
MIL-STD-889	Dissimilar Metals.

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STANDARDS

MILITARY (cent'd)

MIL-STD-1189	Standard Department of Defense Bar Code Symbology.
MIL-STD-1472	Human Engineering Design Criteria for Military Systems, Equipment and Facilities.
MS-3116	Connector, Plug, Electric, Series 1, Solder Type, Straight, Bayonet Coupling.

HANDBOOKS

MIL-HDBK-695	Rubber Products: Recommended Shelf Life.

2.1.2 Other Government documents and drawings. The following other Government documents and drawings form a part of this specification to the extent specified herein. Unless otherwise specified, the issues shall be those in effect on the date of the solicitation.

Naval Air Systems Command

SD-24	General Specification for Design and Construction of Aircraft Weapon Systems.
NAVAIR-1605AS41O -	Tactical Ventilator Mount Assembly.

Naval Sea Systems Command

NAVSEA NOTICE 9310 -	Responsibilities and Procedures for the Naval Lithium Battery Safety Program.

Headquarters, Department of the Army

Army Field Manual FM 3-5	NBC Decontamination

(Copies of specifications, standards, handbooks, drawings, and other Government documents required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted shall be those listed in the issue of the DODISS specified in the solicitation. Unless otherwised specified, the issues of documents not listed in the DODISS shall be the issue of the nongovernment documents which is current on the date of the solicitation.

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AEROSPACE MATERIALS SPECIFICATIONS

AMS-3238	Butyl Rubber, Phosphate Ester Resistant.

(Application for copies should be addressed to the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS

ASTM D 3951	Commercial Packaging.

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Qualification. Ventilators furnished under this specification shall be products which are authorized by the qualifying activity for listing on the applicable qualified products list at the time set for the opening of bids (see 4.3 and 6.3).

3.2 First article. When specified in the contract or purchase order, a sample shall be subjected to first article inspection (see 4.4 and 6.4).

3.3 Select lon of specifications and standards. Specifications and standards for necessary commodities and services not specified herein shall be selected as specified ‘in MIL-STD-143.

3.4 Materials. Materials referenced herein shall conform to applicable specifications and standards. Materials that are not covered by specifications and that are not specifically described herein shall be the best quality and the lightest practical weight. Materials shall be corrosion resistant, or suitably treated to resist corrosion due to fuels, salt spray, environmental , chemical or biological warfare conditions.

3.4.1 Aluminum alloy. Aluminum alloy parts shall be anodically treated as specified in MIL-A-8625. To provide adequate bonding, the aluminum oxide film formed by this treatment shall be removed from the actual contact area of all surfaces that act as a path for electrical current and from the areas under fasteners used for assembly or mounting purposes.

3.4.2 Dissimilar metals. Dissimilar metals shall not be used in intimate contact with each other. Dissimilar metals are defined in MIL-STD-889.

3.4.3 Nonmetallic materials. Rubber seals and o-rings shall meet the requirements as specified in AMS-3238 and the requirements specified herein.

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3.4.4 Fungus-proof materials. All materials shall be incapable of supporting fungoid growth,

3.4.5 Age. Elastomeric components shall be comprised of materials with expected shelf life of greater than 5 years in accordance with MIL-HDBK-695 when consistent with the properties required for functional suitability, These components alone or as part of an assembly shall be delivered to the Government with less than 18 months elapsed from date of cure/manufacture to the date of delivery to the Government.

3.4.6 Toxic materials. The use of materials which produce toxic effects under any conditions shall be avoided.

3.4.7 Flammable materials. The use of materials which will support combustion shall be avoided.

3.5 Design. The ventilator shall be used with and form part of the protective assembly (PASS), as shown on Figure 1. The ventilator shall meet the requirements as specified in MIL-P-85833 and this specification. The ventilator shall be designed as shown on Figure 2. It shall be a compact and portable unit suitable for carriage on the aircrewman during ground operations and mounting in the aircraft during flight. The ventilator shall function without interruption upon being connected to or disconnected from an external power source. When connected to an external power source the battery power shall not be utilized and inadvertent charging of the battery shall not be possible. The ventilator shall be designed to utilize the mounting bracket as specified in NAVAIR 1605AS410. The design of the ventilator shall be such as to minimize the retention of moisture and dust and to facilitate inspection, servicing, maintenance and cleaning. The design shall permit decontamination, using procedures of Army FM 3-5, without damage to or deterioration of the ventilator or its protective capability.

3.5.1 Storage life. The ventilator, less battery, shall be designed to meet the performance requirements of this specification after five years storage under worldwide climatic conditions specified in MIL-STD-210, when packaged as specified in MIL-STD-794.

3.5.2 Interchangeability. All parts, subassemblies and assemblies having the same part number shall be identical as specified in DOD-STD-480 and DOD-STD-100. When any unit or part is interchanged, the ventilator shall meet all performance limits without adjustment of any controls or modification of any part or subassembly.

3.5.3 Printed wiring boards. Printed wiring boards shall be designed as specified in MIL-P-55110.

3.5.4 Reverse polarity, The ventilator shall not be damaged by the inadvertent reversal of the battery polarity.

3.6 Construction.

3.6.1 Standard parts. Military standard parts shall be used whenever they are suitable for the purpose. Standard parts shall be as specified in MIL-E-5400,

3.6.1.1 Non standard parts approval. Request for approval for the use of non standard parts shall be as specified in MIL-STD-965, Procedure I.

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3.6.2 Selection of printed wiring boards. The selection of parts and materials shall be as specified in MIL-STD-454, Requirement 17 or with the approval of the acquiring activity. Microelectric technology should be utilized to the fullest extent possible. Components shall be rated so that the ventilator shall function within the limits of this specification after extended inoperative periods while carried in military aircraft and subjected to the varied range of environmental conditions defined herein. Nonrepairable subassemblies, as outlined in MIL-E-5400, shall be used when practical.

3.6.2.1 Printed wiring board modifications. Printed wiring board modifications shall be performed as specified in MIL-P-28809.

3.6.3 Electronic components. All electronic components shall be as specified in MIL-STD-454.

3.6.4 Insulating materials. Electrical Insulating materials shall be as specified in MIL-STD-454, Requirement 11. Insulation for power circuits shall be arc-resistant as specified in MIL-STD-454, Requirement 26.

3.6.5 Encapsulation and embedment. Materials for encapsulation and embedment shall be as specified in MIL-STD-454, Requirement 47.

3.6.6 Semiconductor devices. Semiconductor devices shall be selected and applied as specified in MIL-STD-454, Requirement 30. Microelectronic devices shall be selected and applied as specified in MIL-STD-454, Requirement 64. Use of nonstandard parts shall be substantiated by reliability data or testing to assure adequate device reliability for the application.

3.6.7 Resistors. Resistors shall be as specified In MIL-STD-454, Requirement 33.

3.6.8 Capacitors. Capacitors shall be chosen and applied as specified in MIL-STD-454, Requirement 2.

3.6.9 Soldering. Soldering shall be as specified in MIL-STD-454, Requirement 5.

3.6.10 Relays. Relays shall be as specified in MIL-STD-454, Requirement 57.

3.6.11 Miring. Wiring shall be as specified in MIL-W-16878.

3.7 Hardware.

3.7.1 Fasteners. All fasteners, including bolts, screws, nuts, rivets, washers and hinges shall be as specified in SD-24.

3.8 Quantitative reliability requirements. When tested in accordance with MIL-STD-781 as specified in 4,8.3.3, the mean time between failure (MTBF) for the ventilator, based on an exponential distribution of failure times, the lower single sided 90 percent confidence limit, shall be 500 hours (excluding batteries). The performance requirements specified in 3.9.1, 3.9.2, 3.9.3, 3.9.4 and 3.9.5 shall be the reliability requirements for determining mean time between failures.

3.9 Performance.

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3.9.1 Leakage.

3.9.1.1 Suction, When tested as specified in 4.8.2.1.1, there shall be no leakage recorded over a period of one minute.

3.9.1.2 Pressure. When tested as specified in 4.8.2.1.2, there shall be no leakage recorded over a period of one minute.

3.9.2 Pressure drop. When tested as specified in 4.8.2.2, the pressure drop through each filter canister port shall be equal within five percent.

3.9.3 Back pressure. When tested as specified in 4.8.2.3, the back pressure of the system shall be not greater than 2.5 in. WG. at an air flow of 100 lpm.

3.9.4 Insulation resistance. When tested as specified in 4.8.2.4, the resistance between the battery connector terminals shall be not less than five megohms at 250 volts d.c.

3.9.5 Pressure and flow.

3.9.5.1 External power on ground. When tested as specified in 4.8.2.5.1, the pressure at the outlet of the delivery hose shall be within the limits as shown on Figure 4.

3.9.5.2 Battery power on ground. When tested as specified in 4.8.2.5.2, the pressure at the outlet of the delivery hose shall be within the limits as shown on Figure 4.

3.9.5.3 External power at 10,000 feet. When tested as specified in 4.8,2.5.3, the pressure at the outlet of the delivery hose shall be within the limits as shown on Figure 5.

3.9.6 Electromagnetic compatability. Electromagnetic comparability of the ventilator shall be as specified in MIL-STD-461, category Alb, when tested as specified in 4.8.2.6.

3.9.7 Delivery hose noise. The noise level measured at the delivery hose outlet of the ventilator shall not exceed that detailed per Figure 3, as determined by 1/3 octave band analysis over the frequency range 200-5000 Hz, when tested as specified in 4.8.2,7.

3.9.8 Chemical agent permeation. The ventilator seals, o-rings, gaskets, hoses and hose connectors and o-ring materials shall have an endpoint of 360 minutes minimum, when tested as specified 4.8.2.8.1, 4.8.2.8.2 and 4.8.2.8.3,

3.9.9 Endurance. Prior to and at the completion of each endurance test, the ventilator shall be tested and meet the requirements of 3.9.1, 3.9.2, 3.9.3, 3.9.4, and 3.9.5.

3.9.9.1 Electrical. When tested as specified in 4.8.3.1, the ventilator shall meet the requirements of 3.9.1, 3.9.2, 3.9.3, 3.9.4, and 3.9.5 and shall operate without failure.

3.9.9.2 Mechanical. When tested as specified in 4.8.3.2, the ventilator shall meet the requirements of 3.9.1, 3.9.2, 3.9.3, 3.9.4, and 3.9.5 and shall operate without failure.

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3.9.10 Environmental tests. Prior to and at the completion of each environmental test, the ventilator shall be tested and shall meet the requirements of 3.9.1, 3.9.2, 3.9.3, 3.9.4, and 3.9.5.

3.9.10.1 High temperature. When tested as specified in 4.8.4.1, the ventilator shall operate without failure.

3.9.10.2 Low temperature. When tested as specified in 4.8.4.2, the ventilator shall operate without failure.

3.9.10.3 Salt fog. When tested as specified in 4.8.4.3, the ventilator shall operate without failure and show no structural degradation.

3.9.10.4 Rain. When tested as specified in 4.8.4.4, the ventilator shall operate without failure.

3.9.10.5 Fungus. When tested as specified in 4.8.4.5, the ventilator shall not support fungal growth and shall operate without failure.

3.9.10.6 Low pressure, high humidity. When tested as specified in 4.8.4.6, the ventilator shall operate without failure.

3.9.10.7 Dust. When tested as specified in 4.8.4.7, the ventilator shall operate without failure.

3.9. 10.8 Normal acceleration. When tested as specified in 4.8.4.8, the ventilator shall operate without failure.

3.9.10.9 High temperature, diurnal cycle and high humidity. When tested as specified in 4.8.4.9, the ventilator shall operate without failure.

3.9.10.10 Shock. When tested as specified in 4.8.4.10, the ventilator shall operate without failure and show no structural degradation.

3.9.10.11 Vibration. When tested as specified in 4.8.4.11, the ventilator shall operate without failure and show no structural degradation.

3.10 Components. The ventilator shall consist of the components specified in 3.10.1 through 3.10.8 and other parts as necessary which are essential to form a complete, assembled, and operating unit.

3.10.1 Housing. The housing shall contain a separate compartment for the battery which allows separate insertion of the battery and insures battery contacts are made and sealed from the environment when the compartment lid is secured. This shall also facilitate changing the battery In contaminated environments while avoiding contamination intrusion.

3.10.2 Filter canister. A maximum of two filter canisters shall be externally mounted to the ventilator body. The filter canisters shall be, or be equal to, NATO Stock Number 4240991353662.

3.10.3 Delivery hose. The ventilator delivery hose shall be fabricated from bromo-butyl rubber. The hose shall be reinforced to prevent kinking and/or overstretching. The end of the delivery hose shall be fitted with a connector which shall mate with MIL-C-85829. The hose shall be 48 inches long or 18 inches long.

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3.10.4 Battery. The battery or batteries used to supply electrical power to the ventilator shall be nonrechargeable. The battery design and ampere-hour rating shall be sufficient to meet the performance requirements of the ventilator as specified herein and provide four hours of operation for the temperature range -4°F to 122°F. Two different battery chemistries may be used for the temperature ranges. The battery design and construction shall be as specified in MIL-B-18 or MIL-B-49430. Lithium batteries shall conform to NAVSEANOTE 9310. Batteries should be equiped with a blocking diode to prevent external charging, a shunt diode to protect each cell from excessive reverse polarity and a nonreplaceable fuse in the negative leg. Shelf life shall be not less than two years at 68°F.

3. 10.4.1 Temperate weather operations battery. The battery design and ampere-hour rating shall be sufficient to provide 4 hours of acceptable ventilator operation in the temperature range of +41 to 122 degrees F (5 to 50 degrees C) as specified herein.

3. 10.4.2 Cold weather operations battery. The battery design and ampere-hour rating shall be sufficient to provide 4 hours of acceptable ventilator operation in the temperature range of -4 to 122 degrees F (-20 to 50 degrees C) as specified herein.

3. 10.4.3 Battery test.

3. 10.4.3.1 Temperate operations. When tested as specified in 4.8.5.1, the minimum air flow measured at the outlet of the delivery hose shall be 4.24 CFM (120 LPM) after 4 hours.

3. 10.4.3.2 Cold weather operations. When tested as specified in 4.8.5.2, the minimum air flow measured at the outlet of the delivery hose shall be 4.24 CFM (120 LPM) after 4 hours.

3.10.5 Switch. A two-position switch ("ON" and "OFF") shall be used to actuate the power to the motor. The switch shall be shielded against inadvertent actuation.

3.10.6 Power changeover jack. An external jack shall be provided to allow the ventilator power cord to be connected to 28 volts d.c. aircraft power. Provision shall be made to seal the jack when not in use.

3.10.7 Strap assembly. A strap assembly shall be attached to the ventilator with a slide release buckle, to allow the aircrewman to carry the ventilator while leaving his hands free.

3.10.8 Power cord. A power cord shall connect the ventilator to the aircraft 28 volts d.c. power. The cord shall be 28 inches in length and be secured to the ventilator to prevent snagging in transit. The power cord shall terminate in a connector, straight MS3116-F-12-3P (SR).

3.11 Dimensions. The envelope dimensions of the ventilator, complete with filter canister(s) shall be per figure 2.

3.12 Height. The weight of the ventilator shall be not greater than seven pounds.

3.13 Color. The ventilator shall be colored black, approximately matching color number 37038 as specified in FED-STD-595.

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3.14 Nameplates and identification markings. Nameplate approval, equipment identification marking and serial number assignment, shall be as specified in MIL-N-18307.

3.15 Configuration. The ventilator furnished shall be produced under a program for managing system configuration as specified in DOD-STD-480, MIL-STD-483 and MIL-STD-490.

3.16 Human engineering. Human performance and human engineering design criteria for the ventilator shall be as specified in MIL-STD-1472.

3.17 Workmanship. The ventilator shall be uniform in quality and shall be free from irregularities, defects, burrs, cracks, dents 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 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 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.

4.1.1 Responsibility for compliance. All items must 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 absense of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material , either indicated or actual, nor does It commit the Government to acceptance of defective material.

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

a. Qualification inspection (see 4.3).
b. First article inspection (see 4.4).
c. Quality conformance Inspection (see 4.5).
d. Quality conformance verification Inspection (see 4.6).

4.3 Qualification Inspection. Qualification inspection shall be performed in the order specified in Table I, consisting of all the tests and examinations listed in this specification.

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4.3.1 Qualification samples. Qualification samples shall consist of fifteen ventilators. Samples shall be forwarded to a test facility set forth in the letter of authorization to submit samples (see 6.3). The samples shall be plainly identified by securely attached durable tags marked with the following Information:

> Samples submitted by (name) (date) for qualification inspection as specified in MIL-V-85830(AS) and number under authorization (reference authorizing letter and number) (see 6.3).

4.3.1,1 Disposition of samples. Upon completion of qualification Inspection, all samples shall be consumed or destroyed and shall not be considered as part of the quantity to be delivered under contract.

4.3.2 Retention of qualification, To retain qualification, the contractor shall forward a report at six month intervals to the qualifying activity. The qualifying activity shall establish the initial reporting date. The report shall consist of a summary of the results of the tests performed, indicating the number of samples that have passed and the number that have failed during the six month period. If the summary of the test results Indicates non conformance with specification requirements, and corrective action acceptable to the qualifying activity has not been taken, action may be taken to remove the failing product from the qualified products list. Failure to submit the report within 30 days after the end of each six month period may result in loss of qualification for the product. In addition to the periodic reports, the contractor shall immediately inform the qualifying activity of inspection data indicating failure of the qualified product to meet this specification. In the event that no production occurred during the reporting period, a report shall be submitted certifying that the company still has the capabilities and facilities necessary to produce the item, If during two consecutive reporting periods, there has been no production, the manufacturer may be required at the discretion of the qualifying activity, to submit the qualified product to testing in accordance with qualification inspection requirement and the reason for no production.

4.4 First article inspection. First article inspection shall be performed in the order specified in Table 11.

4.4.1 First article samples. After award of the contract or order, the manufacturer shall submit three ventilators. The samples shall be representative of the construction, workmanship and materials to be used during production. When a manufacturer is in continuous production of these ventilators from contract to contract, submission of further first article samples on a new contract may be waived at the discretion of the acquiring activity (see 6.2.1). Approval of the first article samples or the waiving of the first article inspection does not preclude the requirements of submitting to the quality conformance inspection. The first article Inspection samples shall be furnished to the Government as directed by the contracting officer (see 6.2.1),

4.4.1.1 Disposition of samples. Upon completion of the first article inspection, one approved ventilator shall be returned to the manufacturer for use in monitoring production. The other samples shall be consumed or destroyed in the first article inspection and shall not be considered as part of the quantity to be delivered under contract.

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4.5 Quality conformance inspection. Quality conformance inspection shall consist of all the examinations and tests specified in Table III. The sampling and Inspection levels shall be as specified In MIL-STD-105.

4.5.1 Inspection lot. An inspection lot size shall be expressed in units of one ventilator made by one manufacturer under essentially the same conditions and from the same materials and components.

4.5.1.1 Packaging. An inspection lot size shall be expressed in units of one fully prepared shipping container, containing ventilators, fully prepared for delivery, made from essentially the same materials and components. The sample unit shall be one shipping container, containing ventilators, fully prepared for delivery, with the exception that the shipping container need not be sealed.

4.5.2 Sampling for tests and examinations of ventilators. The sample size, acceptance criteria, tests and examinations required for the ventilators shall be as specified in Table III.

4.6 Quality conformance verification inspection. At the option of the Government and upon completion of the quality conformance inspection requirements of 4.5, a random sample, one for every 150 or fraction thereof, shall be selected from each lot of ventilators (see 6.2.1). Each ventilator, selected as a sample unit, shall be forwarded to a laboratory designated at the time of the award. The designated laboratory shall conduct any or all the tests and examinations of 4.8 of this specification. The serial numbers of the units in the lot, represented by the sample units, shall be included with the data accompanying the samples to the laboratory. The Government activity responsible for conducting the quality conformance verification program shall report the results of the tests and examinations to the designated inspection and acceptance activity specified in the acquisition document. Final acceptance of the lot from which the sample units were selected shall be based upon successful completion of the inspection program by the cognizant Quality Assurance Representative/ Specialist at the contractor's facility; applying the applicable acceptance criteria specified in Table III.

4.6.1 Rejected lots. If an inspection lot is rejected, the manufacturer may rework it to correct the defects, or screen out the defective units, and resubmit for reinspection. Resubmitted lots shall be inspected using tightened inspection and shall not thereafter be tenderd for acceptance unless the former rejection or requirement of correction is disclosed. Such lots shall be separated from new lots and shall be clearly identified as reinspected lots.

4.7 Test conditions.

4.7.1 Temperature and pressure. Unless otherwise specified In the contract, inspections shall be conducted at local ambient temperature and barometric pressure. Corrections shall be made to provide agreement with the temperature and pressure calibration of the instruments. Inspection data provided by an instrument not calibrated to normal temperature and pressure (NTP) conditions shall be corrected to determine NTP conditions. NTP conditions are 70°F and 29.92 in. Hg.

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4.8 Inspection methods.

4.8,1 Visual examination.

4.8.1.1 Ventilator. Every ventilator shall be examined visually for critical defects to determine conformance to this specification. In addition, every ventilator, selected as a sample unit from the lot, shall be visually examined for minor defects to determine conformance to this specification. The classification of defects (see Table IV), shall be used to classify the defects found.

4.8. 1,1.1 Dimensions. Each ventilator, selected as a sample unit from the lot, shall be checked dimensionally to determine conformance to the dimensions herein.

4.8.1.2 Packaging. Each of the fully prepared shipping containers, containing ventilators, selected as a sample unit from the lot, shall be examined to determine that the packaging, packing and marking conform to this specification. The list of defects (see Table V), shall be used to enumerate the defects found,

4.8.2 Performance

4.8.2.1 Leakage.

4.8.2, 1.1 Suction. The filter canister(s) shall be removed and the canister ports blocked off using canister blanks. A suction of three in. WG, shall be applied to the outlet of the delivery hose and leakage shall be measured for a period of one minute. The leakage shall be as specified in 3.9.1.1.

4.8.2. 1.2 Pressure. The filter canister(s) shall be removed and the canister ports blocked off using canister blanks. A positive pressure of five in. WG. shall be applied to the outlet of the delivery hose and measured for a period of one minute. The leakage shall be as specified in 3.9.1.2.

4.8.2.2 Pressure drop. The pressure drop through each filter canister port shall be measured at a flow of 150 lpm. and shall be as specified in 3.9.2.

4.8.2.3. Back pressure. With the filter canister blanks replaced with filter canisters and with an air flow of 100 lpm. applied to the outlet of the air supply hose, the back pressure of the system shall be measured and shall be as specified in 3.9.3.

4.8.2.4 Insulation resistance. With the motor switch in the 'OFF' position the resistance between the battery connector terminals shall be measured with a 250 volt d.c insulation tester as specified in 3.9.4.

4.8.2.5 Pressure and flow.

4.8.2.5.1 External power on ground. The ventilator shall be connected to an external power supply of 28.0 volts d.c. With the motor switch in the 'ON' position, the pressure at the outlet of the delivery hose shall be recorded at an air flows of O, 25, 50, 75, 100, and 125 1pm. and shall be as specified in 3.9.5.1.

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4.8.2,5.2 Battery power on ground. The nominal battery voltage shall be applied across the ventilator battery terminals. With the motor switch in the 'ON' position, the pressure at the outlet of the delivery hose shall be recorded at air flows of 0, 25, 50, 75, 100, and 125 lpm. and shall be as specified in 3.9.5.2.

4.8.2.5.3 External power at 10,000 feet. The ventilator shall be placed in an altitude chamber and the pressure shall be reduced to .7 standard atmospheres over a period of 15' minutes. The ventilator shall be switched on with 28 volts d.c. applied to the external connector. The pressure at the outlet of the air supply hose shall be as specified in 3.9.5.3.

4.8.2.6 Electromagnetic compatability. The ventilator shall be tested in accordance with MIL-STD-462 and shall meet the requirements as specified in 3.9.6.

4.8.2.7 Delivery hose noise. The noise in the frequency range of 200-5000 Hz. generated at the outlet of the air supply hose under air flow conditions shall be measured. Characteristics shall be plotted for air flows of 25, 50, 100, and 150 lpm. through the air supply hose with the ventilator " operating from an external supply of 28 volts d-c. The ventilator shall meet the requirements specified in 3.9.7.

4.8.2.8 Chemical agent permeation. Rubber seals, o-rings, gaskets, hose, and hose connectors from the ventilator, shall be tested for chemical agent permeation. Test slabs made of the same formulation, thickness, cure time and cure temperature shall be used in lieu of ventilator materials.

4,8.2 .8.1 Mustard. Resistance to permeation by mustard shall be tested as specified in MIL-STD-282, Method T-209. The material shall meet the requirements as specified in 3.9.8.

4.8.2 .8.2 Vx. Resistance to permeation by Vx shall be tested as specified in MIL-STD-282, Method T-208. The material shall meet the requirements as specified in 3.9.8.

4.8.2.8.3 Thickened soman. Resistance to permeation by thickened soman shall be tested as specified in MIL-STD-282, Method T-208. The material shall meet the requirements as specified in 3.9.8.

4.8.3 Endurance.

4.8.3,1 Electrical. With the ventilator operating from an external supply of 28 volts d-c., and using a suitable test rig for creating a typical airflow pattern of the mask, the ventilator motor shall operate for four hours switched 'ON' followed by one hour switched 'OFF'. This cycle shall be repeated 200 times. At the conclusion of the motor endurance test, the ventilator shall be tested in accordance with 4.8.2.1, 4.8.2.2, 4.8.2.3, 4,8.2.4 and 4.8.2.5 and shall meet the requirements of 3.9.1, 3.9.2, 3.9.3, 3.9.4, and 3.9.5 as specified in 3.9.9.1.

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4.8.3.2 Mechanical. The canister ports shall be fitted securely with canisters which shall then be removed. This operation shall be repeated 200 times. A battery shall be installed 200 times and the motor shall be switched 'ON' and 'OFF' each time to ensure correct operation. There shall be no damage to the electrical contacts on the ventilator. At the conclusion of the mechanical endurance test, the ventilator shall be tested in accordance with 4.8.2.1, 4.8.2.2, 4.8.2.3, 4.8.2.4, and 4.8,2.5 and shall meet the requirements of 3.9.1, 3.9.2, 3.9.3, 3.9.4, and 3.9.5 as specified in 3.9.9.2.

4.8.3.3 Reliability. Five ventilators shall be tested using Test Plan IVC of MIL-STD-781. (These units shall not be the same units used for environmental testing.) Each ventilator shall be subjected to 315 hours of testing. The test cycle shall be 14 hours in duration and shall consist of a 7 hour hot mission and a 7 hour cold mission. Cold mission temperature levels shall start at +131°F, rise to +158°F for 1 hour followed by 1 hour at +131°F with the remaining 5 hours at -14°F. Hot mission temperature levels shall start at -14°F lowered to -40°F for 1 hour, followed by 1 hour at -14°F, with the remaining 5 hours at +131°F. Each ventilator shall be simultaneously vibrated during the test cycles. The vibration shall be conducted in each of 3 axes (vertical, horizontal, longitudinal). The ventilator shall be secured to the vibrator by the ventilator mount assembly (drawing 1605AS410). Each ventilator shall accumulate 15 vibration cycles in each axis. Canisters shall be changed after every 24 hours of vibration time. Power shall be provided by simulated 28vdc aircraft power. The ventilators shall be subjected to the operational tests as specified in 4.8.2.1, 4.8.2.2, 4.8.2.3, 4.8.2.4 and 4.8.2.5 and meet the requirements of 3.8.

4,8.4 Environmental tests. Environmental tests shall be conducted in the sequence specified in Table VI. Prior to and at the completion of each envrionmental test, the ventilator shall be tested as specified in 4.8.2.1, 4.8.2.2, 4.8.2.3, 4.8.2.4, and 4.8.2.5, and shall meet the requirements of 3.9.10. For each environmental test which requires operation of the ventilator, 28 volts d.c. external power shall be supplied at the external power connector, unless otherwise specified in the contract.

4.8.4.1 High temperature. The ventilator shall be tested as specified in MIL-STD-810, Method 501.2, Procedure II, Operation. The ventilator shall be placed in a climatic chamber. The chamber temperature shall be raised to 158°F at a rate of 5F° per minute. The chamber temperature shall be maintained at that temperature for a period of one hour. The relative humidity shall not exceed 75 percent. The temperature shall then be reduced to 131°F at a rate of 5F° per minute and maintained at that temperature for a period of six hours. External power shall be connected at the external connector. The motor switch shall be selected to the "ON" position. The ventilator shall meet the requirements specified in 3.9.10 and 3.9.10.1.

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4,8,4,2 Low temperature. The ventilator shall be tested as specified in MIL-STD-810, Method 502.2, Procedure II, Operation. The ventilator shall be placed in a climatic chamber. The chamber temperature shall be lowered to -40°F at a rate of 5F° per minute. The chamber temperature shall be maintained at that temperature for a period of one hour. The temperature shall then be brought to -14°F at a rate of 5F° per minute and maintained for a period of six hours. External power shall be connected at the external connector. The motor switch shall be selected to the "ON" position. The ventilator shall meet the requirements specified In 3.9.10 and 3.9.10.2.

4.8.4.3 Salt fog. The ventilator shall be tested as specified in MIL-STD-810, Method 509.2. The test shall consist of four alternating periods of 24 hours exposure and 24 hours drying time. The ventilator shall be placed in the test chamber with the filter canister(s) assembled. At the conclusion of the test the ventilator shall be examined for corrosion and deterioration of metal parts, finishes, materials and components. The ventilator shall meet the requirements specified in 3.9.10 and 3.9.10.3.

4.8.4.4 Rain. The ventilator shall be subjected to the rain test as specified in MIL-STD-810, Method 506.2, Procedure I, Blowing Rain, for a period of one hour. The rainfall rate shall be four Inches per hour. During the test the ventilator shall be operating. The ventilator shall meet the requirements specified in 3.9.10 and 3.9.10.4.

4.8.4.5 Fungus. The ventilator shall be tested as specified in MIL-STD-810, Method 508.3 for a period of 28 days. The ventilator shall be placed in the test chamber without filter canisters. The ventilator shall meet the requirements specified in 3.9.10 and 3.9.10.5.

4.8.4.6 Low pressure and high humidity. The ventilator shall be subjected to the low pressure test as specified in MIL-STD-810, Method 500.2, Procedure II, Operation. The ventilator shall be placed in the climatic chamber with the motor switch in the 'ON' position. Air outlet pressure at an air flow of 2.7 ± .2 cfm shall be recorded throughout the test. The chamber temperature shall be reduced to -14°F at a rate not exceeding 5F° per minute and the condition maintained for a period of 30 minutes. The pressure in the chamber shall then be reduced to .7 standard atmospheres over a period of 15 minutes and maintained at this pressure for 30 minutes. The chamber humidity shall then be raised and maintained at or close to saturation, while both the chamber temperature is raised to 32°F and the pressure increased to NTP pressure at an approximately linear rate over a period of 15 minutes. The chamber temperature shall then be raised at an approximate linear rate to 86°F with the humidity maintained at or near saturation over a period of 30 minutes. The chamber conditions shall be maintained for a period of not less than one hour and until all frost has melted. The ventilator shall meet the requirements specified in 3.9.10 and 3.9.10.6.

4.8.4.7 Dust. The ventilator shall be subjected to the dust test as specified in MIL-STD-810, Method 510.2, Procedure I, Blowing Dust, for a period of six hours at 73°F and 300 ft./rein. air velocity and six hours at 131°F and 1750 ft./rein air velocity. The relative humidity shall not be greater than 30 percent. During the dust testing the ventilator shall be operating. Air outlet pressure at the outlet of the air supply hose at an air flow of 2.7 ± .2 cfm shall be recorded throughout the test. The ventilator shall meet the requirements specified In 3.9.10 and 3.9.10.7.

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4.8.4.8 Normal acceleration. The ventilator shall be subjected to the acceleration test as specified in MIL-STD-810, Method 513.3, Procedure II, Operation. The acceleration shall be six g's for the test in each of six directions. The acceleration test shall be conducted with the ventilator delivering an air flow of 2.7 + .2 cubic feet per minute at the outlet of the air supply hose. The pressure-at the outlet of the air supply hose shall be recorded both before and after each acceleration test. The pressure shall be within the limits per Figure 3. The ventilator shall meet the requirements specified in 3.9.10 and 3.9.10.8.

4.8.4.9 High temperature, diurnal cycle and high humidity. The ventilator shall be tested as specified In MIL-STD-810, Method 507.2, Procedure II, Cycle 4, normal test duration. The ventilator shall be examined every five days and shall meet the requirements specified in 3.9.10 and 3.9.10.9.

4.8.4.10 Shock. The ventilator shall be tested as specified in MIL-STD-810, Method 516.3, Procedure IV, Transit Drop. The ventilator shall be dropped on each of its six major faces with its lower surface 48 inches above a flat concrete surface. The ventilator shall be dropped six times with a battery. After each drop, the ventilator shall meet the requirements specified in 3.9.10 and 3.9.10.10.

4.8.4.11 Vibration. The ventilator shall be tested as specified in MIL-STD-810, Method 514.3, Category 6 Equipment, general location for AH-1 and UH-1 rotary wing aircraft, main rotor source frequency zone. The ventilator shall be mounted in the mount assembly NAVAIR 1605AS410. External power shall be connected at the external connector. The motor switch shall be selected to the "ON" position. The test duration shall be seven hours for seven cycles in each of three axis. The ventilator shall meet the requirements specified in 3.9.10 and 3.9.10.11.

4.8.5 Battery tests. Batteries shall be climatized at 68 degrees F (20 degrees C) for 16 hours prior to each test.

4.8.5.1 Temperate operations.

4.8.5. 1.1 Temperate operations (high). A fresh battery shall be installed in the ventilator and the battery compartment shall be closed. The ventilator shall be placed in the climatic chamber maintained at 122 degrees F (50 degrees C). The ventilator motor shall be switched "ON" and operate for 4 hours. The minimum flow measured at the end of the delivery hose shall be as specified in 3.10.4.3.1.

4.8. 5.1.2 Temperate operations (low). A fresh battery shall be installed in the ventilator and the battery compartment shall be closed. The ventilator shall be placed in the climatic chamber maintained at 41 degrees F (5 degrees C). The ventilator motor shall be switched "ON" and operate for 4 hours, The minimum flow measured at the end of the delivery hose shall be as specified in 3.10.4.3.1.

4.8.5.2 Cold weather operations.

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4.8.5.2.1 Cold weather operations (high). A fresh battery shall be installed in the ventilator and the battery compartment shall be closed. The ventilator shall be placed in the climatic chamber maintained at 122 degrees F (50 degrees C). The ventilator motor shall be switched "ON" and operate for 4 hours . The minimum flow measured at the end of the delivery hose shall be as specified in 3.10.4.3.2.

4,8.5.2.2 Cold weather operations (1ow). A fresh battery shall be installed in the ventilator and the battery compartment shall be closed. The ventilator shall be placed in the climatic chamber maintained at -4 degrees F (-20 degrees C). The ventilator motor shall be switched "ON" and operate for 4 hours. The minimum flow measured at the end of the delivery hose shall be as specified in 3.10.4.3.2.

5 PACKAGING

5.1 Preservation. Preservation shall be level A or Commercial (see 6.2.1).

5.1.1 Level A. The ventilator shall be preserved Method IIC in accordance with MIL-P-116

5.1.1.1 Cleaning and drying. Cleaning shall be "C-I", any applicable process, in accordance with MIL-P-116 and any drying process of MIL-P-116 may be applied.

5.1.1.2 Preservative. No preservative is required.

5.1.1.3 Unit packaging. The ventilator shall be cushioned with material conforming to PPP-C-795 or PPP-C-1842 and shall be placed with an appropriate amount of desiccant in a sealed bag conforming to MIL-B-117, Types I, II or III, Classes E, F or G, Styles 1, 2 or 3. The bag shall then be placed into a PPP-B-636, Type CF, Class Weather Resistant Unit Container.

5.1.2 Commercial. The ventilator shall be preserved and unit packed in accordance with ASTM D 3951.

5.2 Packing. Packing shall be level A, B or Commercial (see 6.2.1).

5.2.1 Level A. The ventilator, preserved in accordance with 5.1.1.3 shall be packed in containers conforming to Table I of MIL-STD-794, as specified for Level A.

5.2.2 Level B. The ventilator, preserved in accordance with 5.1.1.3 shall be packed in containers conforming to Table I of MIL-STD-794, as specified for Level B.

5.2.3 Commercial' The ventilator, preserved and unit packed as specified above shall be provided packing in accordance with ASTM D 3951.

5.3 Marking. All unit packages and shipping containers shall be marked in accordance with MIL-STD-129, including bar code markings as specified in MIL-STD-129 and MIL-STD-1189.

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6. NOTES

6.1 Intended use. The ventilator covered by this specification is intended to provide the wearer of the PASS with filtered air for ground or airborne use up to 10,000 feet cabin altitude in a CBR environment.

6.2 Ordering data

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number and date of this specification.
b. Applicable Government part number.
c. Whether first article inspection is waived or the name and address of the first article inspection laboratory and the name of the Government activity responsible for conducting the first article inspection program (see 4.4.1).
d. If quality conformance verification inspection is required, the name and address of the designated laboratory and the Government activity responsible for the verification program (see 4.6).
e. Applicable levels of preservation, packaging and packing (see 5.1 and 5.2).
f. Hose length (see 3.10.3).
g. Battery type.
h. Power cord length if different from that specified herein (see 3.10.8).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time set for opening of bids, qualified for inclusion in the applicable Qualified Products List whether or not such products have actually been so listed by that date. The attention of contractors is called to these requirements. Manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they might be eligible to be awarded contracts or purchase orders for the products covered by this specification. The activity responsible for the Qualified Products List is the Commander, Naval Air Systems Command (Code 51122), Department of the Navy, Washington, DC 20361-5110; however, authorization for qualification of products shall be obtained from the Commander, Naval Air Development Center, Narminster, PA 18974, (Code 6031). Prior to submission of the samples for qualification inspection, the manufacturer shall submit a request to the Naval Air Development Center (Code 6031) indicating a date on which the samples can be forwarded and also request an authorization number to accompany the samples.

6.4 First article. When a first article inspection is required, the item should be a first article sample. The first article should consist of 3 complete ventilators. The contracting officer should include specific instructions in acquisition documents, regarding arrangements for examinations, tests and approval of the first article. Invitations for bids should provide that the Government reserves the right to waive the requirements 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.

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6.5 Keyword listing.

Battery
Biological
Canister
CBR protective
CBR resistant
Chemical
Delivery hose
Electromagnetic interference
Housing
Leakage
Motor
Mounting bracket
Power cord
Radiological
Ventilator

Preparing activity:
Navy - AS
(Project 4240-N878)

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Table I. Qualification inspection.

Inspection	Requirement	Test method	Sample number 1	2	3
Visual		4.8.1	x	x	x
Suction leakage	3.9.1.1	4.8.2. 1.1	x	x	x
Pressure leakage	3.9.1.2	4.8.2. 1.2	x	x	x
Pressure drop	3.9.2	4.8.2.2	x	x	x
Back pressure	3.9.3	4.8.2.3	x	x	x
Insulation resistance	3.9.4	4.8.2.4	x	x	x
Pressure and flow/external power/ground	3.9.5	4.8.2.5.1	x	x	x
Pressure and flow/battery power/ground	3.9.5	4.8.2.5.2	x	x	x
Pressure and flow/external power/10000 ft	3.9.5	4.8.2.5.3	x	x	x
Electromagnetic comparability	3.9.6	4.8.2.6	x		
Delivery hose noise	3.9.7	4.8.2.7		x	
Agent permeation/mustard	3.9.8	4.8.2.8.1			
Agent permeation/Vx	3.9.8	4.8.2.8.2			
Agent permeation/thickened soman	3.9.8	4.8.2.8.3			
Endurance/electrical	3.9.9.1	4.8.3.1		x	
Endurance/mechanical	3.9.9.2	4.8.3.2		x	
High temperature	3.9. 10.1	4.8.4,1	See Table VI		
Low temperature	3.9. 10.2	4.8.4.2	See Table VI		
Salt fog	3,9. 10.3	4.8.4.3	See Table VI		
Rain	3.9. 10.4	4.8.4.4	See Table V		
Fungus	3.9. 10.5	4.8.4.5	See Table V		
Low pressure and high humidity	3.9. 10.6	4.8.4.6	See Table VI		
Dust	3.9. 10.7	4.8.4.7	See Table VI		
Normal acceleration	3.9. 10.8	4.8.4.8	See Table VI		
High temperature, diurnal cycle and high humidity	3.9. 10.9	4.8.4.9	See Table VI See Table VI		
Shock	3.9.10.10	4.8.4.10	See Table VI		
Vibration	3.9.10.11	4.8.4.11	See Table VI		
Battery - Temperate	3. 10.4.3.1	4.8.5,1			x
Battery - Cold weather	3.10.4.3.2	4.8.5.2			x

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Table II. First article inspection.

Inspection	Requirement	Test method	Sample number 1	2	3
Visual		4.8.1	x	x	x
Suction leakage	3.9.1.1	4.8.2 .1.1	x	x	x
Pressure leakage	3.9.1.2	4.8.2. 1.2	x	x	x
Pressure drop	3.9.2	4.8.2.2	x	x	x
Back pressure	3.9.3	4.8.2.3	x	x	x
Insulation Resistance	3.9.4	4.8.2.4	x	x	x
Pressure and flow/external power/ground	3.9.5	4.8.2.5.1	x	x	x
Pressure and flow/battery power/ground	3.9.5	4.8.2 .5.2	x	x	x
Pressure and flow/external power/10000 ft	3.9.5	4.8.2 .5.3	x	x	x

Table III. Sample size, acceptance criteria, tests and examination of the ventilator.

Inspection	Section	Sample size	Acceptance criteria
Visual	4.8.1	Normal level II S	For major AQL 1.0% For minor AQL 2.5%
Leakage	4.8.2.1	100%	No defects
pressure drop	4.8.2.2	Normal level II S	AQL 0.657. acceptance number O
Back pressure	4.8.2.3	Normal level II S	AQL 0.65%. acceptance number O
Insulation resistance	4.8,2.4	Normal level II S	AQL 0.65%
Pressure/flow	4.8.2.5	Normal level 11 S	AQL 0.65%
Packaging	4.8.1.2	Normal level II S	AQL 2.5%

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Table IV. Classification of defects for visual examination of the ventilator.

Critical	Minor
1. Material imperfections-foreign matter embedded.	201. Marking missing, insufficient, incorrect, illegible or not permanent.
2. Surface unclean, rough, mis-aligned, or containing cracks, nicks or other flaws.	
3. Any component missing, malformed, fractured, or otherwise damaged.	
4. Any component loose or otherwise not securly retained.	
5. Incorrect assembling or improper positioning of components.	
6. Any functioning part that works with difficulty.	
7. Faulty workmanship or other Irregularities.	

Table V. List of defects for packaging.

Item	Defects
Exterior and interior markings.	Missing, incorrect, Incomplete, illeglble; of improper size, location, sequence; or method of application; markings not the same on the interior and exterior containers.
Packaging and packing materials.	Any non-conforming component; any component miss-ing, damaged, or otherwise defective.
Workmanship.	Inadequate application of the components such as incomplete closure of the unit package, interme-diate package. container flaps, loose strapping, etc.; bulging or distortion of the containers.
Exterior and interior weight or content.	Number per container is more or less than required; gross or net weight exceeds the requirements.

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Table VI. Environmental quailfication test sequence (ventilator).

Test	Unit Number*						
	1	2	3	4	5	6	7
Visual	x	x	x	x	x	x	x
Low Pressure/High Humidity	x	x					
Low Temperature	x	x					
High Temperature	x	x					
Blowing Dust	x	x					
Rain			x	x			
Fungus			x	x			
Salt Fog			x	x			
Acceleration					x	x	
Vibration					x	x	
High Temp/Diurnal/ High Humidity					x	x	
Shock - Transit Drop							x

* These units shall not include the five ventilators used in reliability testing (4.8.3.3)

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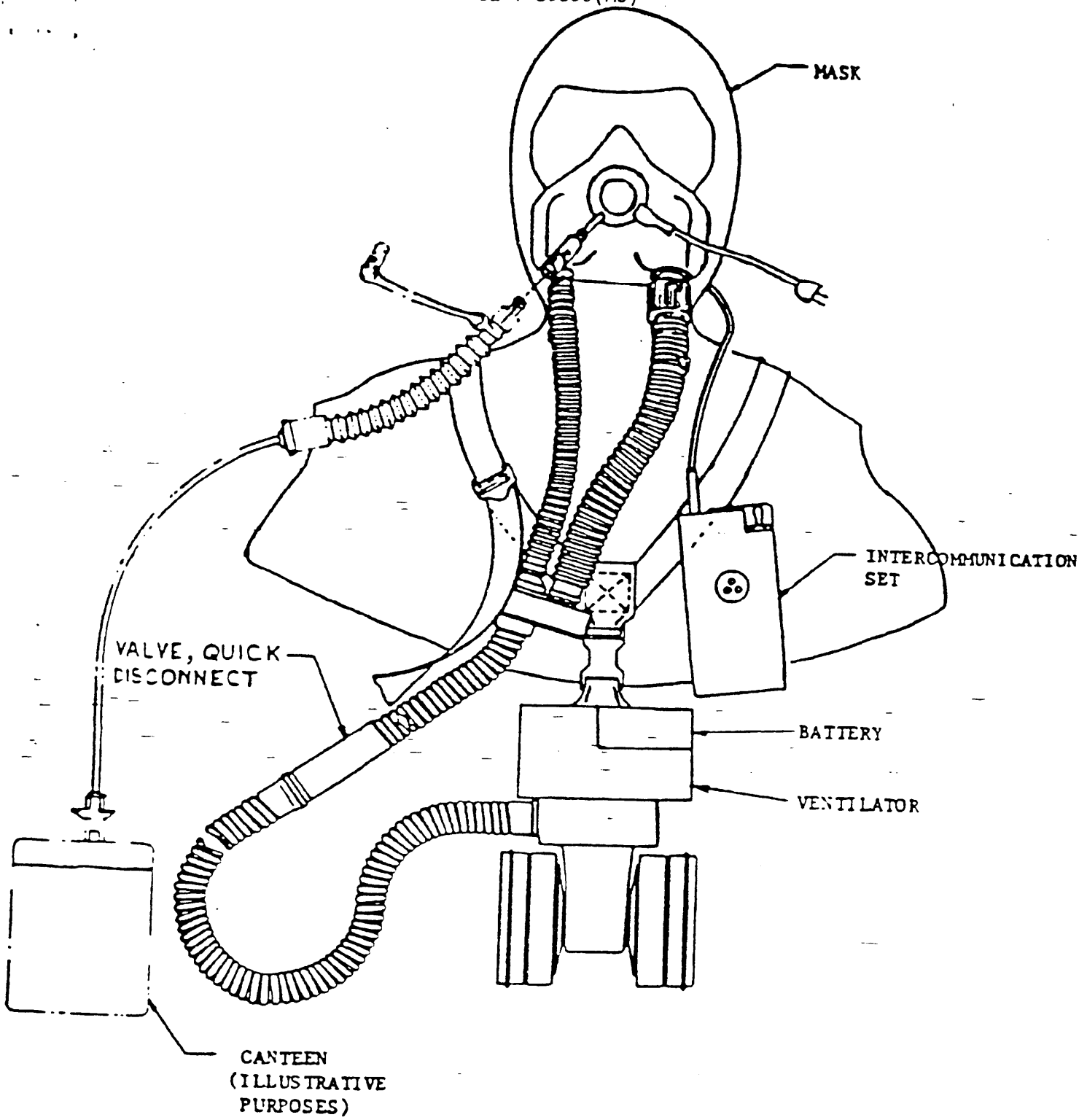

FIGURE 1. PROTECTIVE ASSEMBLY, CBR, HELICOPTER AIRCREWMEMBER

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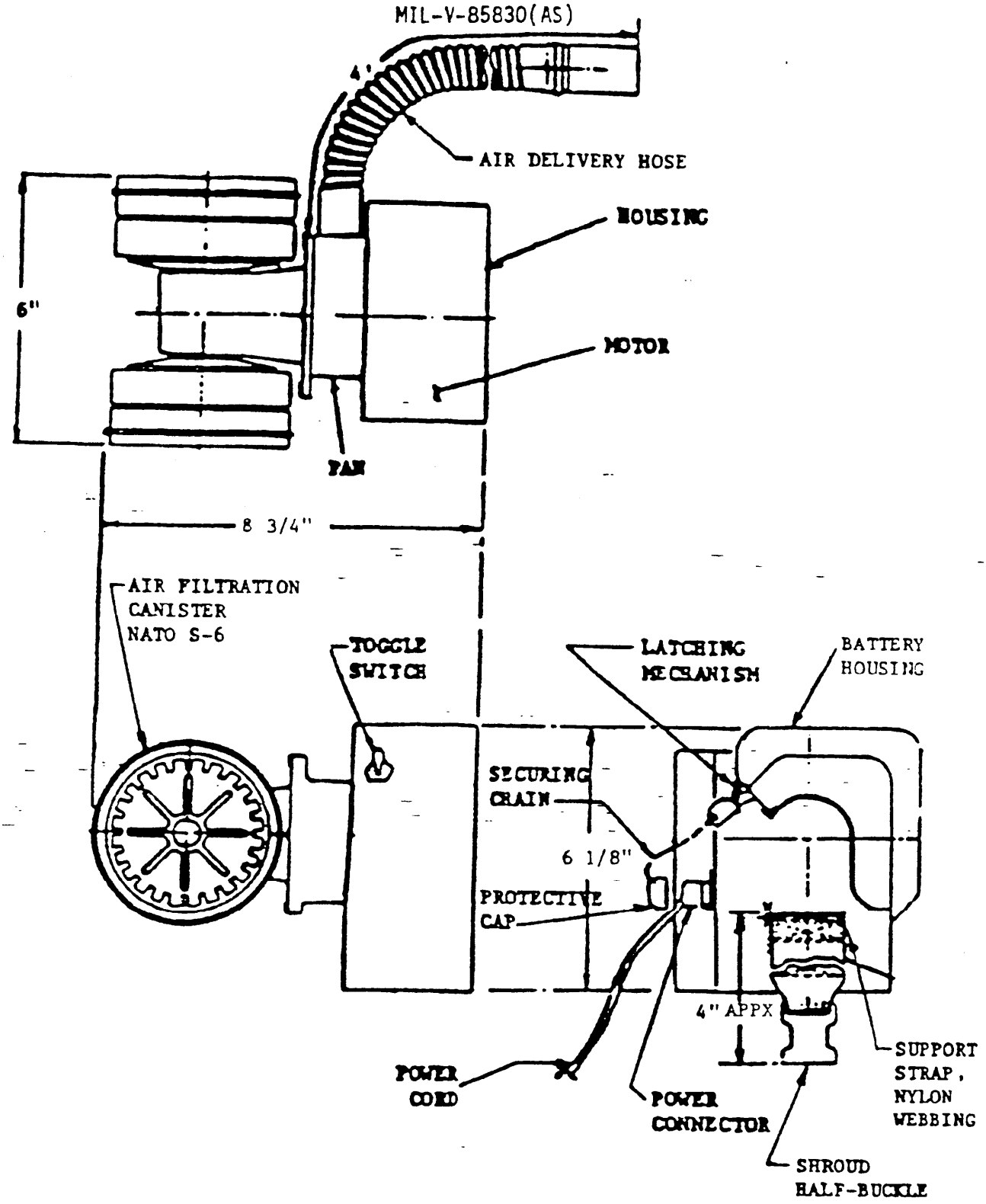

FIGURE 2. VENTILATOR

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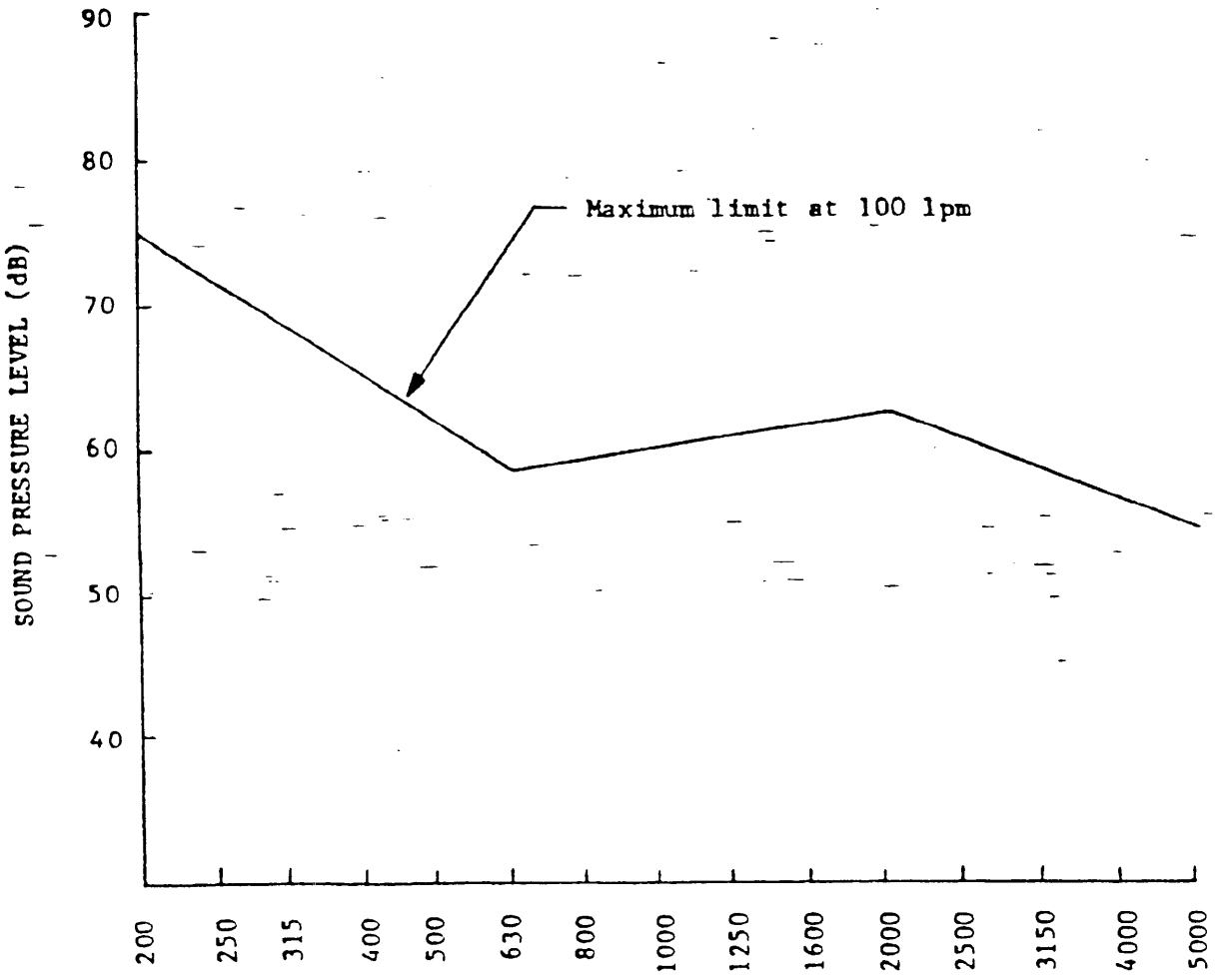

FIGURE 3. Noise Levels at Ventilator Hose Outlet with 100 LPM Air Flow.

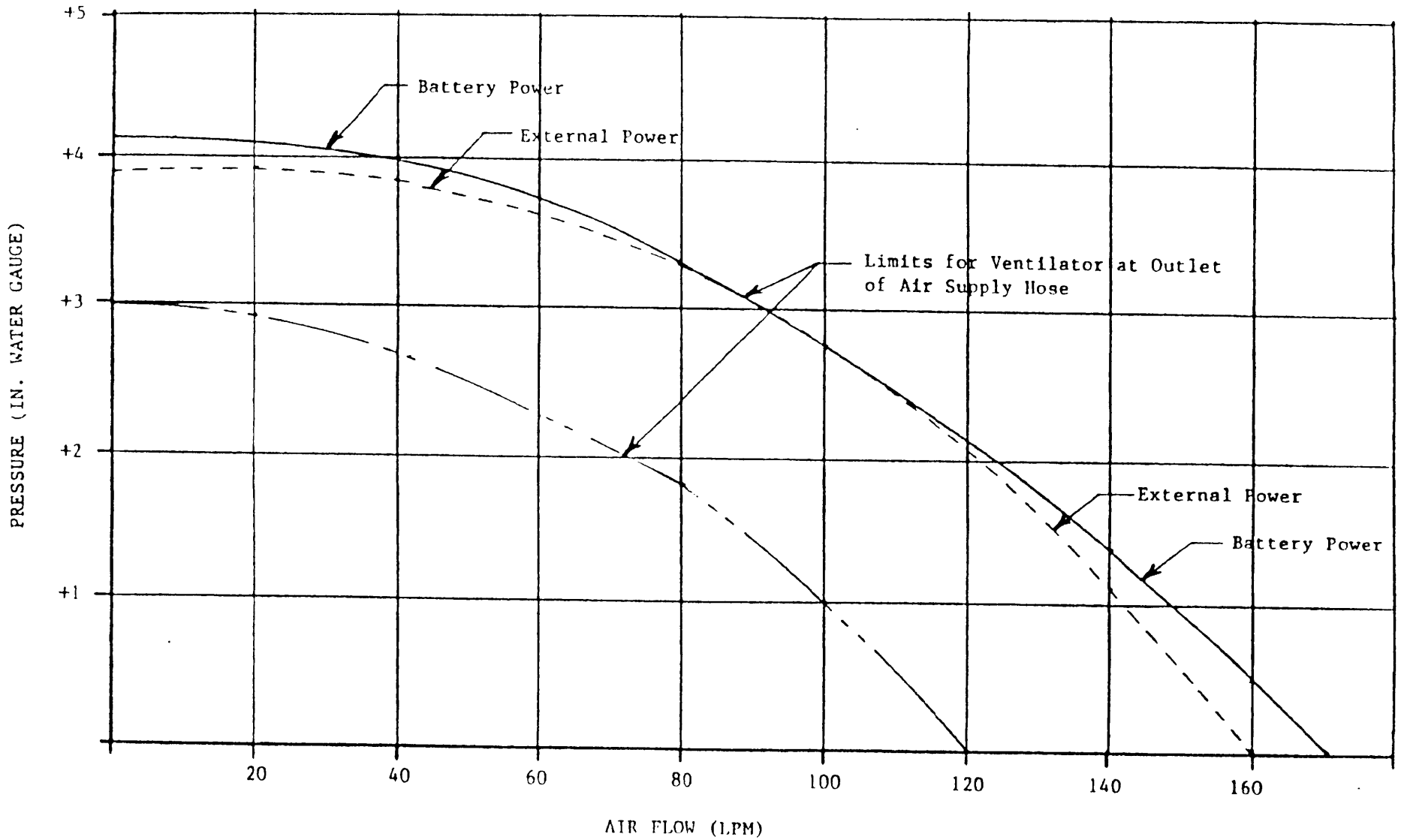

FIGURE 4. PERFORMANCE AT GROUND LEVEL

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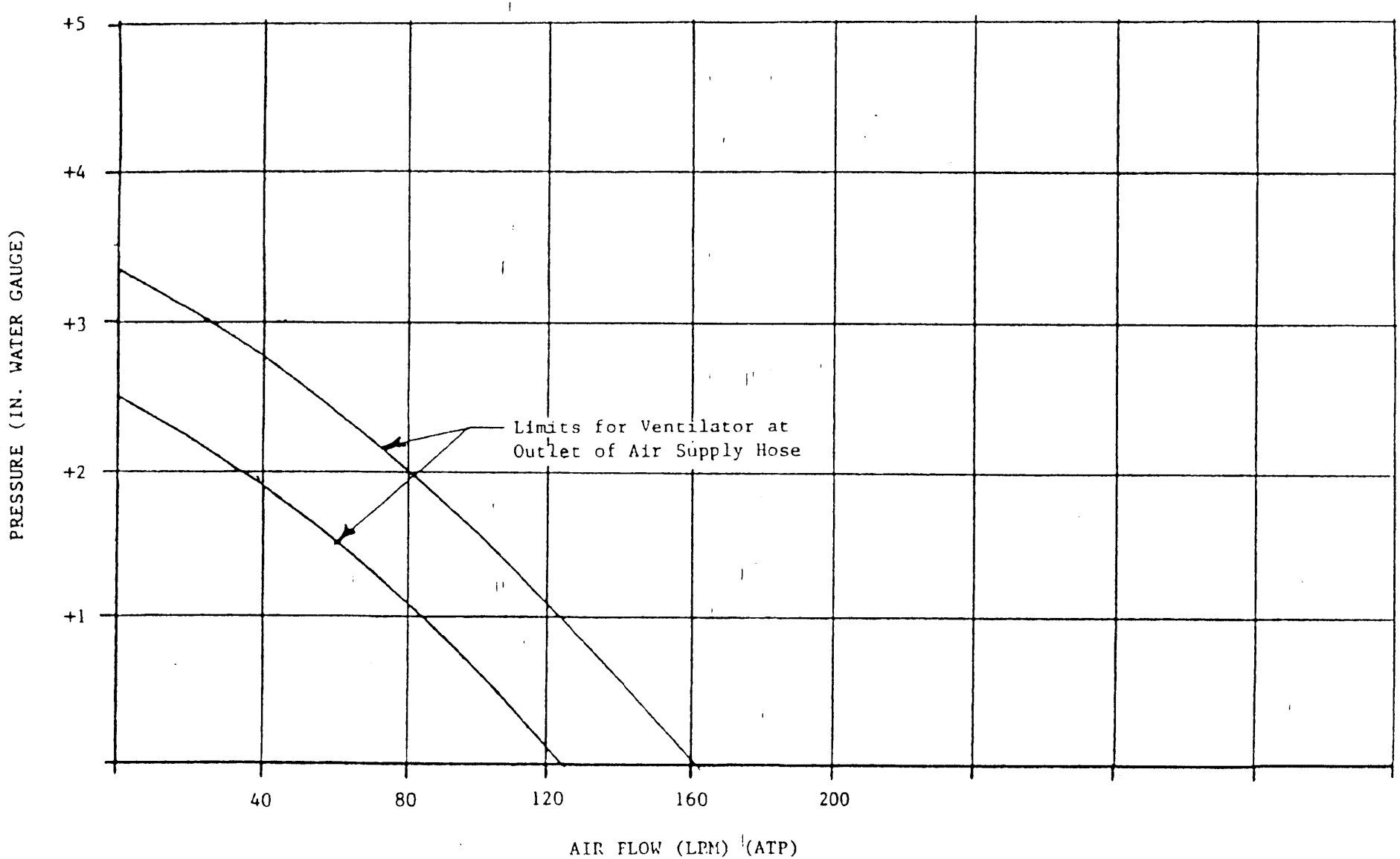

FIGURE 5. PERFORMANCE AT 10,000 FEET (EXTERNAL POWER)

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a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

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