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SPECIFICATION

1 of 1

20963

1. COMPONENT/PART NAME PER GENERIC CODE Ignition Parts & Explosives, Rocket Ignition-Solid, Electrical	2. PROGRAM OR WEAPON SYSTEM Multiple	3. DATE OF:	DAY	MO.	YR.
	5. ORIGINATOR'S SPEC. NO. WS3853	ISSUE	8	12	64
4. ORIGINATOR'S SPECIFICATION TITLE Purchase Description - Igniter, Rocket Motor, Mark 264 Mod 1		REVISION			
	6. SPECIFICATION IS: ☐ DRAFT ☐ PRELIMINARY ☒ FINAL				

7. THIS SPECIFICATION COMPLEMENTS REPORT NO:

8. TYPE OF SPECIFICATION

- ☒ (A) GENERAL PRODUCT REQUIREMENTS FOR A FAMILY OF PARTS - PROCUREMENT DOCUMENT
- ☐ (B) INDIVIDUAL DETAIL PARTS DOCUMENT; STDS BOOK PAGES - FOR PROCUREMENT
- ☐ (C) DETAIL INSPECTION, PROCESS CONTROL, AND/OR TEST PROCEDURES FOR SPECIFIC PARTS
- ☐ (D) PROCESS (PAINTING, WELDING, FINISHING, HEAT TREATING ETC.) APPLICABLE TO MANY PARTS
- ☐ (E) SPEC. FOR PERFORMANCE, RELIABILITY, AND/OR ENVIRONMENT FOR ASSEMBLIES, EQUIPMENTS, SUBSYSTEMS AND SYSTEMS
- ☐ (F) PERFORMANCE AND APPLICATION DATA FOR DESIGN ENG. USE ON PARTS - NOT FOR PROCUREMENT
- ☐ (G) OTHER (DETAIL IN 10.)

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11. SPEC. NO. 415.20.00.40-X7-01

13. PREPARED BY	14. CONTRACTOR	SUBCONTRACTOR
M. H. Sloan 12-7-68	NWC/CL	

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Code Ident
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WS 3853
AMENDMENT 1
11 October 1967

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NAVAL ORDNANCE SYSTEMS COMMAND

DEPARTMENT OF THE NAVY

PURCHASE DESCRIPTION

IGNITER, ROCKET MOTOR, MARK 264 MOD 1

This AMENDMENT forms a part of WS 3853 of 9 December 1966, and has been approved by direction of the Commander of the Naval Ordnance Systems Command, Department of the Navy.

Page 1, paragraph 2.1, SPECIFICATIONS, Military, following MIL-E-5272: Insert

"MIL-C-45662 Calibration System Requirements.".

Page 2, STANDARDS, Military: Delete in its entirety

"MIL-C-45662 Calibration System Requirements.".

Page 3, paragraph 3.3: Delete in its entirety and substitute

"3.3 Function. When subjected to the function test of 4.6.3, the igniter shall meet the following function requirements.".

Page 6, paragraph 4.6.3, first line: Delete "Performance" and substitute "Function".

Page 12, Custodian: Delete "NASC 520216" and substitute "NAVORD ORD 9343".

Page 12, Preparing Activity: Delete "NOTS" and substitute "NWC".

FSC 1336

Code Ident
10001

WS 3853

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NAVAL ORDNANCE SYSTEMS COMMAND

DEPARTMENT OF THE NAVY

PURCHASE DESCRIPTION

IGNITER, ROCKET MOTOR, MARK 264 MOD 1

1. SCOPE.

1.1 This purchase description covers Igniter, Rocket Motor, Mk 264 Mod 1, referred to herein as the igniter. The igniter is initiated by the Mk 5 Mod 0 Squib and is used in the Mk 36 and Mk 50 rocket motors.

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 document to the extent specified herein.

SPECIFICATIONS

Military

MIL-E-5272	Environmental Testing, Aeronautical and Associated Equipment, General Specification for.

FSC 1336

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STANDARDS

Military

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-129	Marking for Shipment and Storage.
MIL-STD-292	Ballistic Nomenclature Rocket Static Tests.
MIL-STD-414	Sampling Procedures and Tables for Inspection by Variables for Percent Defective.
MIL-C-45662	Calibration System Requirements.

DRAWINGS

Bureau of Naval Weapons
(Code Ident 10001)

DL 1568376	Data List, Assemblies, Parts, Specifications, Etc., for Igniter, Rocket Motor, Mk 264 Mod 1 Assembly.
LD 270032	List of Drawings, Assemblies, Parts, Specifications, Etc., for Container, Shipping and Storage, for 64 Igniters Mk 264 Mod 0 or 1.

(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.)

5

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2.2 Other publications. The following document forms a part of this document to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

Code of Federal Regulations

49 CFR 71-78	Interstate Commerce Commission Rules and Regulations for the Transportation of Explosives and Other Dangerous Articles.

(Application for copies should be addressed to the Superintendent of Documents, Government Printing Office, Washington, D.C. 20360.)

3. REQUIREMENTS.

3.1 Preproduction sample. Unless otherwise specified, there shall be a preproduction sample consisting of 42 igniters. The preproduction sample shall be manufactured using the same processes and methods proposed for production. The preproduction sample shall be delivered to the activity designated in the contract or purchase order for preproduction testing in accordance with this document (see Figure 1). Any production by the supplier prior to acceptance of the preproduction sample will be at the supplier's risk.

3.2 Conformance to documents. Unless otherwise specified, the igniter and igniter components shall conform to the requirements specified herein and to the applicable documents listed in section 2 and on DL 1568376 to the extent specified herein.

3.3 Performance. When subjected to the performance test of 4.6.4, the igniter shall meet the following performance requirements.

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3.3.1 Delay time. The time required from the time the igniter is initiated by a firing current of 3.5 plus 0.2 minus 0.5 amperes direct current (dc) until pressure rise is indicated shall be not more than 40 milliseconds (ms). See MIL-STD-292.

3.3.2 Ignition peak. Ignition peak pressure shall be 75 pounds per square inch gage (psig) minimum.

3.3.3 Time to ignition pressure. Time to attain ignition peak pressure shall be 195 ms maximum. (See Figure 2.)

3.3.4 Peak pressure. Peak pressure shall be 75 psig minimum.

3.3.5 Time to peak pressure. Time to attain peak pressure shall be 300 ms minimum to 990 ms maximum. (See Figure 2.)

3.4 Physical characteristics.

3.4.1 Ignition circuit resistance. The igniter squib bridge resistance shall be 0.7 ± 0.2 ohm at 70 degrees Fahrenheit (°F) ± 10°F.

3.4.2 Vibration. After being subjected to the vibration test of MIL-E-5272, Procedure XII, the igniters shall meet the requirements of 3.3 and 3.4.1.

3.5 Workmanship. The appearance of the complete igniter shall indicate manufacture in a careful and workmanlike manner in accordance with good manufacturing practice. The igniter shall be a uniform product free from explosive material on all external surfaces. It shall be uniform in quality, free from foreign material, and manufactured in a manner to assure compliance with the requirements of this document.

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

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supplier may use his own facilities or any commerical laboratory acceptable to the Government. The Government reserves the right to perform any of the inspections set forth in this document where such inspections are deemed necessary to assure that supplies and services conform to prescribed requirements.

4.2 Lot. Except as otherwise specified herein, lot definition and formation shall be in compliance with MIL-STD-105.

4.2.1 Production lot. Production lot definition and formation shall be in compliance with MIL-STD-105 with the reservation that the igniter lot size shall be contingent on the grain lot size.

4.3 Sampling. Unless otherwise specified herein, the establishment of sampling procedures shall be in compliance with MIL-STD-105.

4.4 Classification of tests. Tests shall be classified as follows:

(a) Preproduction (see 4.5).

(b) Quality conformance (acceptance) (see 4.6).

(c) Product verification (see 4.7).

4.5 Preproduction. Preproduction testing shall be in the sequence shown in Figure 1.

4.5.1 Performance acceptance criteria. Any igniter failing to meet the requirements of 3.3 is defective. Acceptance criteria shall be based on an Acceptable Quality Level (AQL) 0.65, Mixed Variables - Attributes Inspection in compliance with MIL-STD-414 with the following deviation: No decision regarding acceptability of the lot represented is to be made until both variable and attribute acceptability criterion are satisfied. If the lot is rejected by variable inspection, attribute inspection shall not be required.

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4.6 Quality conformance. Quality conformance tests shall be conducted on igniters randomly selected from each production lot.

4.6.1 Visual and mechanical inspection. The igniter shall be inspected to verify that the dimensions, marking, construction and workmanship are in compliance with the applicable requirements specified herein insofar as practical without disassembly.

4.6.2 Ignition circuit resistance. The igniter shall be temperature conditioned for not less than one hour at 70 ± 10°F. Using a resistance measuring instrument, having a dc output not greater than 10 milliamperes, measure the squib bridge resistance. Any igniter failing to meet the requirements of 3.4.1 is defective and shall be removed from the lot.

4.6.3 Performance test. The sample for this test shall be five percent, but not less than 25 igniters, of each lot and shall be selected in compliance with MIL-STD-414. The sample igniters shall be temperature conditioned for not less than four hours at 70 ± 5°F. The igniter shall be installed in the test fixture and fired with a firing current of 3.5 plus 0.2 minus 0.5 amperes dc within 10 minutes after removal from the conditioning chamber. Test recordings shall be assessed to determine igniter performance. Any igniter which fails to meet the requirements of 3.3 is defective. Judgement of the lot represented shall be in compliance with the methods of MIL-STD-414, AQL 0.65 percent defective.

4.7 Product verification tests. Product verification tests (Figure 1) shall be conducted on samples of the igniter selected at random from the first production lot submitted for acceptance. The lot immediately following a rejected lot shall be considered a first lot. Acceptance shall be as specified for preproduction performance acceptance (see 4.5.1). When product verification tests are invoked, quality conformance tests shall not apply.

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4.8 Test provisions and conditions. Unless otherwise specified the igniter shall be tested at the atmospheric pressure conditions of the test facility.

4.8.1 Equipment and facilities. Test equipment and inspection facilities shall be provided by the testing activity, and shall be of sufficient quality and quantity to permit the performance of the required tests and measurements, under the conditions and to the accuracies specified herein.

4.8.2 Maintenance and calibration. All test equipment shall be calibrated and maintained in accordance with the provisions of MIL-C-45662. Certification to this effect shall accompany all reports of quality verification, preproduction, or quality conformance inspections.

4.8.3 Test equipment. The test equipment shall provide a recording system having capabilities of measuring:

(a) Pressure of 750 psig with an accuracy of ±1.5 percent of calibration range.

(b) Response of 100 psi per ms, minimum.

(c) Time graduations of 100 ± 20 ms per inch, maximum.

4.8.4 Test fixture. The test fixture shall have a cylindrical chamber having a free volume of 177 ± 2 cubic inches, and a length of 13-1/8 ± 1/16 inches. The chamber shall have two pressure taps, located 180 degrees apart and approximately 10.5 inches from end of chamber to which igniter squib is attached.

4.9 Vibration. Twelve igniters shall be subjected to the vibration tests in compliance with MIL-E-5272, Procedure XII (Figure 1) at the two specified temperatures and at 165°F. Thereafter the igniter shall meet the requirements of 3.4.1 and 3.4.2. The igniter shall be conditioned four hours at the applicable temperature prior to start of test and shall be maintained at that temperature during the test.

4.10 Packaging, packing, and marking. Examination shall be made to ascertain that the packaging, packing, and marking conform to the requirements of section 5 of this document.

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5. PREPARATION FOR DELIVERY.

5.1 Preservation and packaging.

5.1.1 Level A. In addition to detailed requirements herein and in applicable referenced documents, Level A preservation and packaging shall be in accordance with the Code of Federal Regulations 49 CFR 71-78.

5.1.1.1 Packaging of the igniter shall be in compliance with the drawings listed in LD 270032.

5.1.2 Level B. Not applicable.

5.1.3 Level C. Not applicable.

5.2 Packing.

5.2.1 Level A. In addition to detailed requirements herein and in applicable referenced documents, Level A packing shall be in accordance with the Code of Federal Regulations 49 CFR 71-78.

5.2.1.1 Exterior containers. Sixty-four igniters packaged in accordance with 5.1.1.1, shall be packed in accordance with the drawings listed in LD 270032.

5.2.2 Level B. Not applicable.

5.2.3 Level C. Not applicable.

5.3 Marking.

5.3.1 Special markings. Marking for external containers shall be in accordance with the Code of Federal Regulations 49 CFR 71-78.

5.3.2 Normal markings. In addition to the marking required by contract or purchase order, shipping containers shall be marked in accordance with MIL-STD-129.

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6. NOTES.

6.1 Intended use. Igniter Mk 264 Mod 1 is intended for use in rocket motors for SW 1/C and Chaparral.

6.2 Ordering data. Procurement documents should specify the following:

(a) Title, number, and date of this document.

(b) Preproduction sample if different from 3.1.

(c) Name and location of testing activity designated to evaluate the preproduction sample (3.1).

(d) Exceptions to documentary compliance, if applicable (3.2).

(e) Responsibility for inspection, if other than as specified in 4.1.

(f) Lot size (4.2).

(g) Invocation of MIL-C-45662 (4.8.2).

6.3 Advisory note. Sleeve inserts (steel) within the test chamber located opposite the holes in the igniter will prevent erosion of chamber wall, but compensation for volume of sleeves must be made.

6.4 General safety precautions. The loading, assembly and handling of the explosive items covered by this publication, and the subassemblies thereof, involve hazardous operations and therefore require suitable safety precautions. Use of this publication will not be construed as to relieve the supplier or manufacturer of responsibility for the safety of his operations. Listed below are certain minimum provisions which a supplier or manufacturer (which explosively loads the item covered) should observe in order to fulfill his responsibility for safety. At all applicable Government plants, these provisions are mandatory. Such other warnings and precautions, pertinent to the operational effectiveness or safety during use or loading of the specified items are included in the detail technical requirements of the publication.

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6.4.1 All loading operations should be conducted in a neat and orderly manner.

6.4.2 Safe equipment and methods should be utilized for transporting and handling explosives and loaded parts. When performing operations, such as mixing, pouring, weighing, charging, sifting, drying, pressing, casting, crimping, etc., remote control, barricaded handling equipment shall be used.

6.4.3 Personnel handling detonators, primers, delay elements, lead-ins, boosters, and related parts which affect functioning, should avoid using bare fingers or improper equipment in order to prevent damage, corrosion, or deterioration from perspiration or other contaminating deposits.

6.4.4 In order to minimize the absorption of moisture from the atmosphere or other sources during loading and handling operations, the exposure of explosive materials shall be closely controlled.

6.4.5 All explosives and completely or partially loaded items, should be stored in suitable storage magazines located in accordance with the American Table of Distances (ATD) or other applicable safety standards. While in process these items shall be located in accordance with intraplant distances and stored in adequate ready or service magazines if outside of loading rooms. For all Government managed explosives loading plants, the provisions of the Armed Services Explosives Safety Board covering quantity-distance relations for explosives shall apply.

6.4.6 Proper care must be exercised at all times to protect personnel, equipment and loading areas from accidents, fires or explosions. The precautionary measures in the following paragraphs should be observed.

6.4.6.1 Employ properly proportioned and properly located protective barricades, screens or shields at all required points.

6.4.6.2 Keep only minimum quantities of explosives and completed or partially loaded parts present at each stage of operation.

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6.4.6.3 Keep explosives and explosive parts in approved covered receptacles. Ensure covers are in place after material is taken out of or put into the receptacles. Receptacles should be conductive to ground electrostatic charges.

6.4.6.4 Protect operations from electrostatic charges by effectively grounding all machinery, equipment, and fixtures. Employ suitable grounded conductive coverings for floors, work benches, tables, and workers' conductive shoes. Employ workers' clothing of a type to minimize the accumulation of static charges. Fabrics such as silk and nylon, which promote static generation should be avoided. Additional devices, such as grounded bracelets for workers, should be employed where operations are conducted with items unusually sensitive to initiation by static electricity. Such items include initiating explosives, tracer mixtures, and low-energy type electric primers, detonators and squibs. The latter types of items should have the free ends of lead wires bared and twisted together. They shall be packed in relatively small groups wrapped in bare non-insulated aluminum or other uncoated metal foil. During assembly and processing operations, such sensitive electric items should be short circuited by clips or other devices until installed with safety shunt in the final device. Additional precautions for these items from induced electric currents generated by sources such as lightning, static, radiations from communications apparatus, radar, or high frequency heat apparatus, etc., shall be utilized. For safety, humidity of work rooms should be appropriately increased, as required to lessen electrostatic effects without inducing excessive moisture absorption by any of the components.

6.4.6.5 Protect all explosive operations from effects of electric current originating from equipment such as soldering irons, heaters, switches, wiring, motors, lights, test instruments, etc., by suitable insulation, grounding, separation or shielding. Such electric sources may initiate explosives by heat, sparks, arcs, or due to completing an electric circuit through an electric primer, detonator, or squib. Circuits may be inadvertently completed, for example, from a defective electric soldering iron through a grounded contact. Removable short circuiting clips, or other devices shall be employed during manufacturing operations involving electric primers, detonators or squibs.

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6.4.6.6 Enforce the wearing of suitable safety footwear, gloves, goggles, respirators and impregnated garments to protect personnel against burns, poisoning and associated industrial hazards.

6.4.6.7 Allow no fires or exposed electrical or other sparking equipment. Allow little or no flammable material to be present in loading, handling and storage spaces. Enforce proper "Match" and "No Smoking" rules.

6.4.6.8 Enforce good housekeeping and maintain effective policing, inspection and supervisory methods throughout the loading area and surroundings. Employ effective cleaning methods periodically to minimize the accumulation of explosive dust, and other contaminants. Assure its removal from floors, walls, ceilings, ledges, tables, benches, piping, equipment and items being loaded. Clean up any spilled material immediately.

Custodian:
NASC 520216

Preparing Activity:
NOTS/China Lake, California

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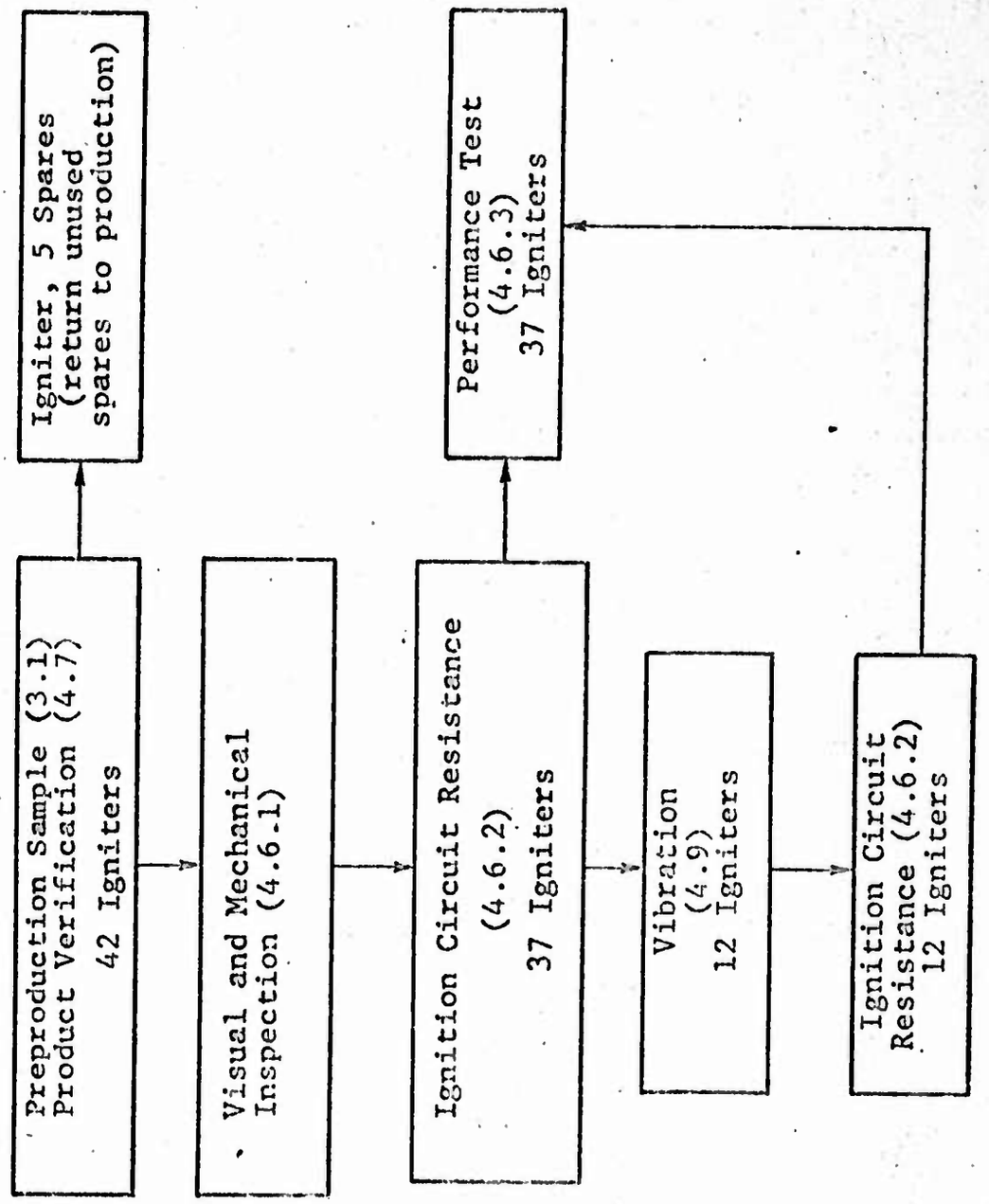

Figure 1. Testing Flow Chart

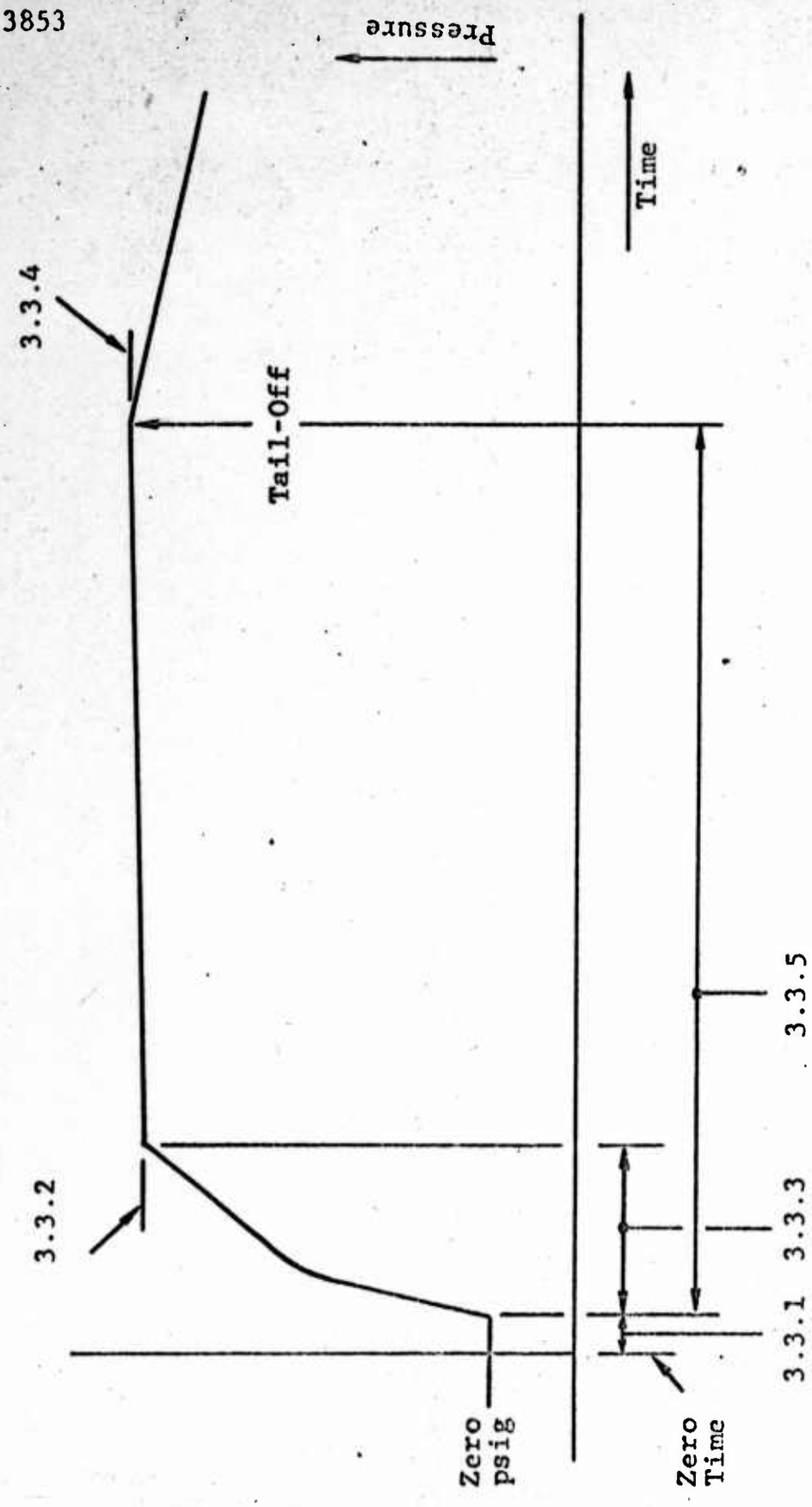

Figure 2. Pressure-Time Curve

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