

FF-H-1820

July 30, 1974

SUPERSEDING

See Section 6

## FEDERAL SPECIFICATION

### HARDWARE, BUILDERS'; EXIT DEVICES

This specification was approved by the Commissioner, Federal Supply Service, General Services Administration, for use of all Federal Agencies.

#### 1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers exit devices and auxiliary hardware items for both interior and exterior application.

#### 1.2 Classification.

1.2.1 Types, functions and grades. Exit devices shall be of the types, functions and grades described in American National Standards Institute (ANSI) A156.3, as specified (see 6.2).

#### 2. APPLICABLE DOCUMENTS

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

#### Federal Specification

PPP-H-1581 - Hardware (Fasteners and Related Items), Packaging and Packing for Shipment and Storage of

#### Federal Standard

Fed. Std. No. 123 - Marking for Domestic Shipment (Civil Agencies)

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards, at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

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(Single copies of this specification and other Federal specifications required by activities outside the Federal Government for bidding purposes are available without charge from Business Service Centers at the General Services Administration Regional Offices in Boston, New York, Washington, DC, Atlanta, Chicago, Kansas City, MO, Fort Worth, Denver, San Francisco, Los Angeles, and Seattle, WA.

(Federal Government activities may obtain copies of Federal Specifications, Standards, and Handbooks, and the Index of Federal Specifications and Standards, from established distribution points in their agencies.)

#### Military Standards

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes
- MIL-STD-109 - Quality Assurance Terms and Definitions
- MIL-STD-129 - Marking for Shipment and Storage

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

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply.

#### American National Standards Institute, Inc. (ANSI)

##### A156.3 - Exit Devices

(Application for copies should be addressed to the American National Standards Institute, 1430 Broadway, New York, NY 10018.)

#### Builders' Hardware Manufacturers' Association (BHMA)

##### 1301 - Materials and Finishes Standard

(Application for copies should be addressed to the Builders' Hardware Manufacturers' Association, 60 East 42nd Street, New York, NY 10017.)

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National Motor Freight Traffic Association, Inc. Agent

National Motor Freight Classification

(Application for copies should be addressed to the American Trucking Associations, Inc., Tariff Order Section, 1616 P Street, N.W., Washington, DC 20036.)

Uniform Classification Committee, Agent

Uniform Freight Classification

(Application for copies should be addressed to the Uniform Freight Classification Committee, Room 1106, 222 S. Riverside Plaza, Chicago, IL 60606.)

Technical society and technical association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.

3. REQUIREMENTS

3.1 Standards compliance.

3.1.1 Exit devices. Except as otherwise specified herein, exit devices shall conform to the requirements of ANSI A156.3.

3.1.2 Auxiliary items. Except as otherwise specified herein, auxiliary items, such as door coordinators, mullions, and thresholds, as specified (see 6.2), shall conform to the requirements of ANSI A156.3.

3.1.2.1 Materials for auxiliary items. Material for door coordinators shall be bronze or brass, or when specified (see 6.2), stainless steel; thresholds shall be of extruded bronze or when specified (see 6.2), aluminum; mullions shall be of steel with prime coat, BHMA 600 (see BHMA 1301).

3.2 Standard commercial product. The exit devices, auxiliary items and associated accessories shall, as a minimum, be in accordance with the requirements of this specification and shall be the manufacturer's standard commercial product. Additional or better features which are not specifically prohibited by this specification but which are a part of the manufacturer's standard commercial product shall be included in the hardware being furnished. Standard commercial product is a product which has been or will be sold on the commercial market through advertisements or manufacturer's catalogs, or brochures, and represents the latest production model(s).

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3.3 First article. When specified (see 6.2), the contractor shall furnish an exit device of each type ordered, and operable auxiliary hardware, for first article inspection and approval (see 4.2.1 and 6.3).

3.4 Interchangeability. All removable units and replacement parts of similar equipment shall be interchangeable with corresponding items or parts and not require hand or machine fitting.

3.5 Tumblers. All tumblers in cylinders shall be fully effective, and shall not permit operation of the lock bolt until each tumbler is moved into its proper position, except for such minor variations in position as may result from ordinary commercial manufacturing tolerances.

3.6 Cylinders. Cylinders for exit devices shall have pins in five or more pin tumbler cavities. Keyway shall be paracentric; that is, it shall have longitudinal ribs, at least one of which on each side of the keyway shall project to or beyond the center line of the keyway. Cylinders shall not be less than 1-1/8 inches in diameter back of the head. When specified (see 6.2), cylinders shall be of a type which is removable from the face of the retainer housing.

3.7 Duplicate keys and change numbers. Information on noncommercial change numbers, and duplicate keys made therefrom, shall not be furnished, except where proper responsibility for exit devices with cylinders and keys or change numbers is clearly indicated.

3.8 Master keys. When specified (see 6.2), cylinders shall be master keyed. Unless otherwise specified (see 6.2), three master keys shall be furnished with each group of master keyed cylinders.

3.9 Fastenings. Hardware furnished under this specification shall be complete with all screws, bolts, etc., necessary for proper application. Such fastenings shall be of suitable size and type and shall harmonize with the hardware as to material and finish.

3.10 Trim and accessories. Unless otherwise specified (see 6.2), trim shall be of a commercial plain design. Items required to be of "modern" design shall be of a commercial decorative design or a shape other than the plainest design otherwise furnished by the manufacturer and regularly cataloged by him. All trim items shall have straight, beveled or smoothly rounded sides, corners, and edges.

3.10.1 Escutcheons. When specified (see 6.2), escutcheons shall be furnished. Minimum size shall be 7 inches x 2-1/4 inches. Bearing minimum length shall be 1/4 inch. Escutcheons shall be cut to suit lock requiring cylinder or key, and when specified (see 6.2), operating trim shall be furnished.

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3.11 Finishes. Exposed surfaces of hardware shall have one of the applicable standard finishes as specified (see 6.2 and 6.6). As far as practicable, finishes as defined in BHMA 1301 should be confined to satin brass, clear coated (BHMA 606), satin bronze, clear coated (BHMA 612), satin chromium-plated brass or bronze (BHMA 626), or satin stainless steel (BHMA 630).

### 3.12 Marking.

3.12.1 Marking of exit devices. The name of the manufacturer, or a trademark by which he can be readily identified, shall be legibly marked on the exit devices where it can be seen after installation. When specified, key change numbers or symbols shall be legibly marked on removable cylinders.

3.12.2 Marking of keys. Unless otherwise specified (see 6.2), key change numbers for cylinders shall be stamped on each key. When specified (see 6.2), each key shall be stamped with the words "U.S. Property-- do not duplicate." Key change numbers shall provide sufficient information for replacement of the key by the manufacturer.

3.13 Lubrication. Prior to shipment, all friction points on moving parts of latches and related hardware shall be lubricated with a graphite, silicone, or similar type lubricant to insure freedom of movement under extreme conditions of temperature and humidity. The lubricant shall be of a type that will not leak out of the mechanism to cause stains or damage to surrounding surfaces.

3.14 Tools. Exit devices and operable auxiliary hardware shall be capable of adjustment and assembly by use of ordinary hand tools.

3.15 Workmanship. All hardware shall be free from imperfections and defects which affect appearance, durability, and serviceability. Finished parts of hardware that are to be set flush shall have accurately machined, true edges. Edges of unfinished steel and iron and unpolished work need not be machine finished but shall be smooth and reasonably true.

## 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The

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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 Inspection of materials and components. In accordance with 4.1, the supplier is responsible for insuring that materials and components used were manufactured, examined, and tested to the extent specified, in accordance with the requirements of referenced subsidiary specifications and standards. The terms and definitions of MIL-STD-109 shall apply.

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

- a. First article inspection (see 4.2.1).
- b. Quality conformance inspection (see 4.2.2).

4.2.1 First article inspection. First article inspection shall be performed on one of each type exit device ordered, and one operable auxiliary hardware item to be supplied when a first article sample is required (see 3.3). This inspection shall include the examination of 4.5 and the tests of 4.6.1 and 4.7. Failure of the first article to pass the examination or any of the tests shall be cause for rejection. The first article may be a standard production item from the supplier's current inventory, provided the unit meets the requirements of the specification and is representative of the design, construction, and manufacturing technique applicable to the remaining units to be furnished under the contract.

4.2.2 Quality conformance inspection. Quality conformance inspection shall be performed on the sample exit devices and operable auxiliary items selected in accordance with 4.4. This inspection shall include the examination of 4.5 and the tests of 4.6.2 and 4.7.

4.3 Inspection lot. All units of the same type, function, and grade offered to the Government at one time, shall be considered a lot for purposes of inspection. The sample unit shall be one complete exit device.

#### 4.4 Sampling.

4.4.1 Sampling for examination. A random sample of exit devices and operable auxiliary items shall be selected from each lot offered to the Government in accordance with MIL-STD-105 at inspection level II. The acceptable quality level shall be 1.5 percent defective for major defects and 4.0 percent defective for minor defects.

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4.4.2 Sampling for tests. A random sample of exit devices and operable auxiliary items shall be selected from each lot offered to the Government in accordance with MIL-STD-105 at inspection level S-4. The acceptable quality level shall be 1.5 percent defective.

4.5 Examination. Each sample exit device and operable auxiliary items selected in accordance with 4.4.1, shall be examined to verify compliance with this specification. Examination shall be conducted as specified in Table I.

Table I. Classification of defects

Categories	Defects
Major:	
101	Type not as specified
102	Dimensions not as specified
103	Components missing
104	Components damaged
105	Sharp or burred edges
106	Flaking, peeling, or blistering of plating
Minor:	
201	Finish not uniform
202	Marking not proper
203	Polished finish not uniform or is scratched

#### 4.6 Tests.

4.6.1 First article. First article exit device and operable auxiliary items shall be tested in accordance with ANSI A156.3. A certificate of compliance, accompanied by certified copies of reports of tests either conducted in the manufacturer's plant and certified by an independent testing laboratory or conducted in an independent laboratory, will be accepted as evidence that the hardware has passed the required tests. When exit device and operable auxiliary items have been previously tested, the test requirements for the first article may be met by submittal of the certified test data from previous first article tests in accordance with this specification, provided the design, construction, and manufacturing techniques have not been changed, and the supplier provides a certified statement to that effect.

4.6.2 Quality conformance. Each exit device and operable auxiliary item selected in accordance with 4.4.2 shall be subjected to the exit test, security test, inside pull test and push test as specified in ANSI A156.3. Any unit failing the required tests shall be rejected.

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4.7 Performance test for finishes. Finishes shall conform to the performance requirements as specified in ANSI A156.3.

4.8 Inspection of preparation for delivery. Preparation for delivery requirements of the hardware shall be inspected to determine conformance with the applicable requirements of section 5 of this specification.

## 5. PREPARATION FOR DELIVERY

5.1 Preservation and packaging. Preservation and packaging shall be level A or C, as specified (see 6.2).

5.1.1 Level A. Exit devices, auxiliary items, and accessories shall be preserved and packaged in accordance with the applicable level A requirements of PPP-H-1581.

5.1.2 Level C. Exit devices, auxiliary items, and accessories shall be preserved and packaged in accordance with the supplier's standard practice.

5.2 Packing. Packing shall be level A, B, or C as specified (see 6.2).

5.2.1 Level A. Exit devices, auxiliary items, and accessories shall be packed in accordance with the applicable level A requirements of PPP-H-1581 except that fiberboard boxes shall not be used.

5.2.2 Level B. Exit devices, auxiliary items, and accessories shall be packed in accordance with the applicable level B requirements of PPP-H-1581.

5.2.3 Level C. The exit devices, auxiliary items, and accessories shall be packed in a manner which will insure arrival at destination in satisfactory condition and be acceptable to the carrier at lowest rates. Containers and packing shall comply with Uniform Freight Classification rules or National Motor Freight Classification rules.

5.3 Marking (see 6.2).

5.3.1 Civil agencies. In addition to any special marking required by the contract or order, the interior packages and shipping containers shall be marked in accordance with Fed. Std. No. 123.

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5.3.2 Military activities. In addition to any special marking required by the contract or order, the interior packages and shipping containers shall be marked in accordance with MIL-STD-129.

## 6. NOTES

6.1 Intended use. Exit devices and auxiliary items covered by this specification are intended to permit exit from a room or building by means of a cross-bar attached to a door.

6.2 Ordering data. Purchasers should select the preferred options offered herein and include the following data in procurement documents:

### 6.2.1 Procurement requirements.

- (a) Title, number, and date of this specification.
- (b) Type, function, and grade of hardware required (see 1.2).
- (c) Auxiliary items required and material required, if other than specified (see 3.1.2 and 3.1.2.1).
- (d) When a first article is required for inspection and approval (see 3.3).
- (e) Type of cylinders required (see 3.6).
- (f) When master keys are required and number of keys required if other than specified (see 3.8).
- (g) Trim design, if other than specified (see 3.10).
- (h) When escutcheons are required, and if operating trim is needed (see 3.10.1).
- (i) Type of finish required (see 3.11).
- (j) When key change numbers are not required and when stamping the words "U.S. Property--do not duplicate" is required (see 3.12.2).
- (k) Level of preservation and packaging and level of packing required (see 5.1 and 5.2).
- (l) Marking required (see 5.3).

6.2.2 Contract data requirements. When this specification is used in a procurement which incorporates a DD Form 1423 and invokes the provisions of paragraph 7-104.9(n) of the Armed Services Procurement Regulation, the data requirements identified below will be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the Contract Data Requirements List (DD Form 1423) incorporated into the contract. When the provisions of ASPR 7-104.9(n) are not invoked, the data specified below shall be delivered in accordance with the contract requirements. Deliverable data required by this specification is cited in the following paragraphs.

<u>Paragraph</u>	<u>Data Requirement</u>	<u>Applicable DD 1664</u>
4.6.1	Certificate of Compliance	DI-E-2121

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(Copies of Data Item Descriptions required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

6.3 First article. When a first article is required, it shall be tested and approved under the appropriate provisions of paragraph 7-104.55 of the Armed Services Procurement Regulation. The first article may be a standard production item from the manufacturer's current inventory. The first article should consist of one unit. The contracting officer should include specific instructions in all procurement instruments, regarding arrangements for examinations, test, and approval of the first article.

6.4 Classification cross-reference. Classification cross-reference, as pertains to exit devices, is furnished for information purposes only. When ordering hardware covered by this specification, the procuring agency should use the type, function, and grade classifications available in ANSI A156.3. Type numbers listed in Table II are only those equal to items previously listed in FF-H-00106b. Many other types, functions, and combinations of types and functions are available in ANSI A156.3, depending on individual needs and applications.

Table II. Classification cross-reference

FF-H-00106b		Corresponding ANSI A156.3 designation		
Type	Description	Type	Function	Description
810	Bolt, panic, rim type, no outside trim	1	01	Rim type. Exit only, no trim.
810H	Bolt, panic, rim type, outside pull and cylinder	1	03	Rim type. Entrance by trim when latch bolt is retracted by key. Key removable only when locked.
810K	Bolt, panic, rim type, outside knob, escutcheon and cylinder	1	09	Rim type. Entrance by knob only when released by key. Key removable only when locked.
820	Bolt, panic, mortise type, no outside trim	3	01	Mortise type, exit only, no trim.

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Table II. (continued)

820H	Bolt, panic, mortise type, outside pull and cylinder	3	03	Mortise type. Entrance by trim when latch bolt is retractable by key. Key removable only when locked.
820K	Bolt, panic, mortise type, outside knob, escutcheon, and cylinder.	3	08	Mortise type. Entrance by knob only when released by key. Key removable only when locked.
821	Bolt, panic, vertical rod type, no outside trim	2	01	Surface vertical rod type, exit only, no trim.
821K	Bolt, panic, vertical rod type, outside knob, escutcheon, and cylinder	2	08	Surface vertical rod type, entrance by knob, key locks and unlocks knob.
822	Combination set: For exit only. Both doors. Bolt, panic, vertical rod type, no outside trim	2 each 2	01	Surface vertical rod type both doors, exit only, no trim.
822A	Combination set: For exit only. Inactive door: bolt, panic, vertical rod type, no outside trim.	2	01	Inactive door: Surface vertical rod type, exit only, no trim.
	Active door: Bolt, panic, mortise type, no outside trim	3	01	Active door: Mortise type, exit only, no outside trim.
822H	Combination set: For entrance and exit. Inactive door: Bolt, panic, vertical rod type, no outside trim.	2	01	Inactive door: Surface vertical rod type, exit only, no trim.
	Active door: Bolt, panic, mortise type, outside pull and cylinder	3	03	Active door: Mortise type, entrance by trim when latch bolt is retracted by key; key removable only when locked.

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Table II. (continued)

822K	Combination set: For entrance and exit. Inactive door: Bolt, panic, vertical rod type, no outside trim. Active door: Bolt, panic, mortise type, outside knob, escutcheon, and cylinder	2	01	Inactive door: Surface vertical rod type, exit only, no trim.
		3	08	Active door: Mortise type, entrance by knob only when released by key. Key removable only when locked.
822N	Combination set: For entrance and exit. Inactive door: Bolt, panic, vertical rod type, no outside trim. Active door: Bolt, panic, vertical rod type, outside knob, escutcheon, and cylinder	2	01	Inactive door: Surface vertical rod type, exit only, no trim.
		2	08	Active door: Surface vertical rod type, entrance by knob, key locks and unlocks knob.

6.5 Deleted type numbers. Type numbers previously presented in FF-H-00106b and not cross-referenceable to ANSI A156.3 were not listed in cross-reference table above. The deleted type numbers are as follows:

811  
833  
833A  
834  
834A  
836

#### 6.6 Finishes.

6.6.1 Selection of finishes. Where finishes other than those specified in 3.11 are required, selection of finishes as defined in BHMA 1301 should be confined to finishes shown in Table III.

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Table III. Finish standards

BHMA Code	Finish description	Base metal	Category	Nearest U.S. Equivalent
601	Bright japanned	Steel	D	US1B
605	Bright brass, clear coated	Brass	A	US3
611	Bright bronze, clear coated	Bronze	A	US9
625	Bright chromium plated	Brass, bronze	A	US26
627	Satin aluminum, clear coated	Aluminum	A	US27
628	Satin aluminum, clear anodized	Aluminum	A	US28
629	Bright stainless steel	Stainless steel 300 series	A	US32

6.6.2 Standard finishes. The standard finishes for builders' hardware are intended primarily to promote reasonable uniformity in the appearance of builders' hardware items. These finishes are subject to undesirable variations in appearance, and samples are used by the manufacturer as a guide for color and texture. Samples of the following finishes are available for reference purposes: BHMA 605, BHMA 606, BHMA 612, BHMA 618, BHMA 625, BHMA 626, BHMA 627, BHMA 628, BHMA 629, and BHMA 630. These may be obtained singly or in sets from the Builders' Hardware Manufacturers' Association, 60 East 42nd Street, New York, NY 10017.

6.6.3 Comparison of standard finishes. Owing to differences in the processes of producing hardware finishes and the variety of metals to which they are applied, it is commercially impracticable to attain an exact match. Therefore, it is understood that hardware delivered in a standard finish from two or more sources will compare reasonably when the items are viewed at arm's length and approximately 2 feet apart. This approximates the conditions of use, as for example, hinges and lock trim on opposite edges of a door.

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6.6.4 Oxidized finishes. Oxidized finishes represent the natural aging of metals and change with time; therefore, some variations from standard may be expected. An oxidized finish artificially produced may not match a similar finish produced by age.

6.7 Supersession data. This specification supersedes that part of FF-H-106a dated November 23, 1948, and FF-H-00106b dated August 21, 1967, which refers to exit devices.

MILITARY CUSTODIANS:

Army - WC

Navy - YD

Air Force - 82

Preparing activity:

Navy - YD

Civil Agency Coordinating Activity:

VA - DMS

Review activity:

DSA - IS

User activity:

Army - ME

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<p><b>INSTRUCTIONS:</b> This sheet is to be filled out by personnel, either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity. Comments and suggestions submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or serve to amend contractual requirements.</p>		
<p><b>SPECIFICATION</b>  <b>FF-H-1820 Hardware, Builders'; Exit Devices</b></p>		
<p><b>ORGANIZATION</b></p>		
<p><b>CITY AND STATE</b></p>		<p><b>CONTRACT NUMBER</b></p>
<p><b>MATERIAL PROCURED UNDER A</b>  <input type="checkbox"/> DIRECT GOVERNMENT CONTRACT    <input type="checkbox"/> SUBCONTRACT</p>		
<p><b>1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?</b>  <b>A. GIVE PARAGRAPH NUMBER AND WORDING.</b></p>		
<p><b>B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES</b></p>		
<p><b>2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID</b></p>		
<p><b>3. IS THE SPECIFICATION RESTRICTIVE?</b>  <input type="checkbox"/> YES    <input type="checkbox"/> NO (If "yes", in what way?)</p>		
<p><b>4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)</b></p>		
<p><b>SUBMITTED BY (Printed or typed name and activity - Optional)</b></p>		<p><b>DATE</b></p>

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1 JAN 66

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