

INCH-POUND
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MIL-PRF-12329E(CR)

3 July 1997

SUPERSEDING

MIL-R-12329D (EL)

30 October 1986

## PERFORMANCE SPECIFICATION

## REELING MACHINE, CABLE, HAND RL-31( )

This specification is approved for use by the USACECOM, Department of Army, and is available for use by all Departments and Agencies of the Department of Defense.

## 1. SCOPE

1.1 Scope. This specification covers a lightweight, portable, hand operated reel unit designated as Reeling Machine, Cable, Hand RL-31( ) (see 6.1).

## 2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, U.S. Army Communications-Electronics Command, ATTN: AMSEL-LC-LEO-E-EP, Fort Monmouth, NJ 07703 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.
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AMSC N/A:

FSC 3895

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2.2 Non-Government publications. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation(see 6.2).

## AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI/ASQC Z1.4 - Sampling Procedures and Tables for  
Inspection by Attributes.

(Application for copies should be addressed to the American National Standards Institute, 11 West 42<sup>ND</sup> Street, New York, NY 10036.)

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

### 3. REQUIREMENTS

3.1 First article. When specified (see 6.3), a sampling shall be subjected to first article inspection.

3.2 Design, materials, and manufacturing. Unless otherwise specified, the design materials, and manufacturing process selection is the prerogative of the contractor provided all articles submitted to the government fully meet the operating, interface, ownership and support, and operating environment requirements specified in this document.

3.3 Finish, protective. The equipment shall be finished in a dull lusterless finish.

3.4 Marking. Mark directly or by label to include nomenclature, contract number, serial number, date, manufacturer code, part number, and national stock number. Use clear and legible lettering and a method of marking to withstand the operating environment.

3.5 Operating requirements. Each unit shall provide the following functional, operational, and performance capabilities:

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3.5.1 Crank GC-4( ). When tested in accordance with 4.5, the brake shall properly fit each end of the axle and shall be capable of rotating the axle with reels by hand.

3.5.2 Brake GC-10( ). When tested in accordance with 4.6, the brake shall bring each Reel RL-159( )/U fully loaded with Wire WD-1A/TT, to a smooth stop from a speed of 300-350 rpm within 5 seconds and shall properly fit each end of the split axle.

3.6 Interchangeability. Like units, assemblies, subassemblies and replaceable parts should fit all other units so that they are usable with other units; i.e., physically and functionally interchangeable without modification.

3.7 Operational. When tested in accordance with 4.7, the Reeling Machine RL-31( ) shall perform satisfactorily. There shall be no binding or seizing of axle bearings and the brakes shall not seize and shall smoothly stop the rapidly turning loaded reel of wire.

3.8 Operational life. The equipment shall be capable of continuous operations with no binding or seizing of axle bearings and the brakes shall not seize and shall smoothly stop the rapidly turning reel when tested as specified in 4.8. The equipment shall then be tested per 4.4 and meet the requirement of 3.6.

3.9 Environmental conditions.

3.9.1 Rain. The equipment shall meet specified performance during and after exposure to blowing rain and drip.

3.9.2 Moisture resistance. The equipment shall be examined 24 hours after the test specified in 4.9.3 and there shall be no evidence of corrosion, or any other form of deterioration. The equipment shall then meet the requirements of 3.7.

3.9.3 Temperature. The equipment shall perform satisfactorily when tested per 4.9.2 and meet the requirements of 3.7 at steps specified.

3.9.4 Bounce. After subjection to the bounce test per 4.9.4, the equipment shall be capable of meeting the requirements of 3.7 and there shall be no physical damage except minor surface abrasions.

3.9.5 Vibration. The equipment shall have no mechanical resonance below 55 cycles per second when tested per 4.9.5, and meet the requirements of 3.7.

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3.10 Technical literature. Technical literature shall be furnished as specified in the contract.

#### 4. VERIFICATION

4.1 Classification of inspections. Inspection requirements are classified as follows:

- a. First article inspection (see 4.3.1).
- b. Conformance inspection (see 4.3.2).

4.2 Verification methods. The types of verification methods included in this section are visual inspection, measurement, sample tests, full-scale demonstration tests, simulation, modeling, engineering evaluation, component properties analysis, and similarity to previously approved or previously qualified designs.

4.2.1 Verification alternatives. The manufacturer may propose alternative test methods, techniques, or equipment, including the application of statistical process control, or cost-effective sampling procedures, to verify performance. See the contract for alternatives that replace verifications required by this specification.

4.3 Order of inspection. Perform visual inspection of samples first.

4.3.1 First article inspection. First article inspection shall be performed on the first seven (7) units which have been produced with equipment and procedures used in production (production-representative units) when a first article sample is required (see 3.1).

4.3.2 Conformance inspection. Conformance inspection shall include those examinations and tests from Table I as defined in the contract.

4.3.3 Finish inspection. Inspect externally visible colors of all materials to be dark color (i.e., black, olive drab, brown, etc.) to facilitate existing military camouflage schemes. Make ten measurements at different points on the system surface using a 60 degree glossmeter. Conform the average value of these ten readings does not exceed ten percent.

4.3.4 Marking inspection. Verify the presence of the system designator, contract number, serial number, date, manufacturer code, part number, and national stock number in clear and legible lettering. If labeling is used, verify that the method used to attach label to assemblies, subassemblies, and units withstand all environmental testing without any sign of breakage.

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TABLE I. Verification table.

Inspection	Requirement paragraph	Test paragraph
Interchangeability	3.6	4.4
Crank GC-4( )	3.5.1	4.5
Brake GC-10( )	3.5.2	4.6
Operational	3.7	4.7
Operational Life	3.8	4.8
Rain	3.9.1	4.9.1
Temperature	3.9.3	4.9.2
Bounce	3.9.4	4.9.4
Vibration	3.9.5	4.9.5

4.4 Inspection for dimensional interchangeability. The dimensions listed below shall be gauged or measured to determine conformance to the physical interchangeability requirement of 3.6. When a listed dimension is not within specified or design limits, it shall be considered a major defect.

- a. Crank GC-4( ) - I.D 1-1/32" square hole  $\pm 1/64$ ".
- b. Brake GC-10( ) - I.D 1-1/32" square hole  $\pm 1/64$ ".
- c. Axle - O.D 1" square  $\pm 1/64$ ".

4.5 Crank GC-4( ). With axle loaded with 2 reels RL-159( )/U, each having 1 mile of Wire WD-1/TT or 2 kilometers of wire WD-1A/TT, the crank shall be placed on each end of the real axle and rotated. The equipment shall meet the requirements of 3.5.1.

4.6 Brake GC-10( ). With axle loaded with 2 reels RL-159( )/U, each loaded with 1 mile of Wire WD-1/TT or 2 kilometers of Wire WD-1A/TT, apply pressure to the lever handle of each brake when turning 300-350 rpm. The equipment shall meet the requirements of 3.5.2.

4.7 Operational. The equipment loaded with 2 reels RL-159( )/U, each having 1 mile of Wire WD-1/TT or 2 kilometers of Wire WD-1A/TT shall be operated to simulate paying out wire at a speed of 1320 feet per minute. Each RL-159( )/U shall be rotated with the other reel hold stationary until the wire is completely paid out and meet the requirements of 3.7.

4.8 Operational life. Four equipment, 2 loaded per 4.8, shall be operated to simulate paying out wire at a speed of 1,320 feet per minute. Each RL-159( )/U shall be rotated separately. Each RL-159( )/U shall be run continuously for 6 hours and meet the requirements of 3.8.

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#### 4.9 Environmental conditions.

4.9.1 Rain. The test item should be tested in all the configurations of blowing rain and water tightness. The rainfall rate may be tailored to the anticipated deployment locale and duration. A minimum rate of 10 cm/hr (4 in/h) is recommended. For these tests, droplet sizes should be predominately in the range of approximately 0.5 mm in diameter (which is considered to be mist or drizzle rather than rain). Wind driven rain gusts in excess of 18 m/s may be required to test plan. Test item on vertical surfaces rather than horizontal surfaces.

4.9.2 Temperature. Complete a test for high and low temperature as follows.

4.9.2.1 High temperature. Test for continuous operation between natural ambient and 126°F for a period of 72 hours. Test for storage and transportation between natural ambient and 160°F for a period of 168 hours.

4.9.2.2 Low temperature. Test for continuous operation between natural ambient and -26°F for a period of 24 hours. Test for storage and transportation between natural ambient and -31°F for a period of 52 hours.

4.9.3 Moisture resistance. Subject a sample to natural cyclic high humidity conditions under randomly varied temperatures between 79°F and 95°F with relative humidity randomly varied between 79 and 100% over a 24 hour period. Stabilize the test item at ambient conditions for another 24 hours.

4.9.4 Bounce. Place a sample in its carrying case and shipping case and vibrate to the levels normally induced during combat transportation as loose cargo. Visually inspect sample for any signs of damage.

4.9.5 Vibration. The equipment shall be tested as follows to determine compliance with 3.9.5.

a. The equipment shall be fastened in its normal mounting position on a vibration table that can be controlled within 10 percent of the specified amplitude. The vibration table shall provide approximately sinusoidal vibration.

b. The equipment shall be vibrated successively in 3 mutually perpendicular directions that are parallel respectively to the edges of the equipment, over a frequency range of 10 to 55 cycles per second, in 1-cycle-per second steps and maintain each frequency for at least 10 seconds. The total input excursion shall be constant at 1/64 inch.

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c. Mechanical resonance, if any, of the complete structure, of subassemblies, and of component parts shall be determined visually by means of a Strobotac, as made by the General Radio Corporation, Cambridge Massachusetts, or equal, or by other means, provided that vibration of the part is not affected by the measurement.

4.10 Visual and mechanical. Equipment shall be examined for defects listed in Table II.

TABLE II. Classification of visual and mechanical defects.

Classification	Defects
MAJOR	Misalignment of reel shaft. Poor welds. Brake not operating correctly after all adjustments are made. Bent supports. Shaft, not spinning freely, binding or jamming.
MINOR	Parts are not complete. Brake adjustment not correct. Improperly assembled. Painting not complete. Flaking or peeling of paint. Small scratches.

## 5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

## 6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

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6.1 Intended Use. Reeling Machine, Cable, Hand RL-31( ) is a lightweight, portable hand operated reel unit used in paying out and recovering field Wire WD-1A/TT on Reel RL-159( )/U and on Reel DR-5( ).

6.2 Acquisition documents. Acquisition documents should specify the following:

- a. Title, number, and date of this specification and any amendment.
- b. Issue of the DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced.
- c. When a first article is required (see 3.1, 4.3.1, and 6.3).
- d. Sample plans for verification inspection and test. For general information only; Sampling in past procurements using a detailed design specification was conducted using MIL-STD-105. However, MIL-STD-105 is canceled and replaced by American National Standard, ANSI/ASQC Z1.4.
- e. When conformance verification is required (see 4.3.2 and 6.4).
- f. Packaging requirements (see 5.1).
- g. The parentheses in the nomenclature will be deleted or replaced by a letter identifying the particular design; for example: AN/AVS-6(V)(3). The contractor should apply for nomenclature according to the applicable contract clause.

6.3 First article. When requiring a first article inspection, contracting documents should provide specific guidance to offerors. This guidance should cover whether the first article is a first article sample, a first production item, or the number of test items. These documents should also include specific instructions regarding arrangements for examinations, approval of first article test results, criticality of test results, and disposition of first articles. Pre-solicitation documents should provide Government waiver rights for samples for first article inspection to bidders offering a previously acquired or tested product. Bidders offering such products who wish to rely on such production testing must furnish evidence with the bid that prior Government approval is appropriate for the pending contract.



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6.4 Conformance inspection. Affordable conformance inspection with confidence varies depending upon a number of procurement risk factors. Some of these factors include: contractor past performance, government schedules and budget, product material and design maturity, manufacturing capital equipment and processes applied, the controlled uniformity of those processes, labor skill and training, and the uniformity of measuring processes and techniques. During the solicitation, contracting documents should indicate those tests desired from Table I and their designated frequency based on a risk assessment for the procurement.

6.5 Drawings. For general information only, items have been produced to this specification using the following drawing package.

DL-SM-B-599258 - Reeling Machine, Cable, Hand RL-31( ).

Copies of this drawing package are available from US Army Communications Electronics Command (CECOM), AMSEL-LC-COM-C-CM, Ft Monmouth, NJ 07703.

6.6 Subject term (key word) listing.

Axle  
Brake GC-10( )  
Crank GC-4( )

6.7 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

Custodian:  
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**I RECOMMEND A  
CHANGE:**

1. DOCUMENT NUMBER  
MIL-PRF-12329E(CR)

2. DOCUMENT DATE (YYMMDD)  
970703

3. DOCUMENT TITLE REELING MACHINE, CABLE, HAND RL-31

4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)

5. REASON FOR RECOMMENDATION

**6. SUBMITTER**

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