| NOT MEASUREMENT |
| SENSITIVE |

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7 February 1992
SUPERSEDING
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MILITARY SPECIFICATION

CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL, INTERVEHICULAR (24 VOLT TO 12 VOLT REDUCTION)

This specification is approved for use by the Naval Facilities Engineering 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 covers one type of cable assembly used to interconnect the 24-volt (V) electrical system of a Military-type towing vehicle and the 12V electrical system of a commercial trailer or semitrailer.

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 document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

|Beneficial comments (recommendations, additions, deletions) and any pertinent|
|data which may be of use in improving this document should be addressed to: |
|Commanding Officer (Code 156), Naval Construction Battalion Center, Port |
|Hueneme, CA 93043-5000, 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 2590

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SPECIFICATION

MILITARY

MIL-C-55442 - Cable Assemblies and Cord Assemblies, Packaging of.

STANDARDS

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-130 - Identification Marking of U.S. Military Property.
MS75020 - Connector, Plug, Electrical - 12 Contact, Intervehicular, 24 Volt, Waterproof.

(Copies of specifications, standards, handbooks and publications, 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 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 which are current on the date of the solicitation (see 6.2).

SOCIETY OF AUTOMOTIVE ENGINEERS, INC. (SAE)

SAE J560 - Seven-Conductor Electrical Connector for Truck-Tractor Jumper Cable.
SAE J561 - Electrical Terminals-Eyelet and Spade Type.
SAE J1067 - Seven Conductor Jacketed Cable for Truck Trailer Connections.

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

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification takes precedence. Nothing in this specification, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Description. The cable assembly shall consist of a 7-contact cable connector plug conforming to SAE J 560, not less than 10 feet of 7-conductor cable conforming to SAE J1067, a voltage control unit, not less than 2 feet of

7-conductor cable conforming to SAE J1067, and a 12-contact cable connector plug conforming to MS75020. The voltage control unit shall provide the required reduction of voltage from a 24V tractor system for 24V or 12V trailer operation.

3.2 First article. When specified (see 6.2), the contractor shall furnish a cable assembly for first article inspection and approval (see 4.2.1 and 6.4).

3.3 Construction. The cable assembly shall be constructed so that a straight pull of not less than 75 pound-force between the jumper cable and each cable connector plug or the voltage control enclosure shall be resisted without damage to the components. Cable terminations, at cable connector plugs and at the voltage control unit, shall incorporate a strain relief which relieves all tension from the individual electrical connections. Conductor insulation shall be protected against abrasion, due to vibration or as a result of applied tension, at points of contact with conducting material.

3.3.1 Cable. Jumper cable shall conform to SAE J1067.

3.3.2 Cable terminations. The 7-contact cable connector plug shall conform to SAE J560. The 12-contact cable connector plug shall be the pin type conforming to MS75020, Part No. MS75020-1. Conductor terminals, within the control box, shall conform to SAE J561 with the type to be determined by the manufacturer.

3.3.3 Cable dimensions. The cable shall be molded into a cylindrical coil incorporating spring-like properties, so that following extension, the cable will retract to its original shape. The cable length from the 12-contact cable connector plug to the voltage control unit shall be not less than 2 feet when extended, and the coil length shall be not more than 6 inches when the cable is retracted. The cable length from the voltage control unit to the 7-contact cable connector plug shall be not less than 10 feet when extended and the coil length shall be not more than 2 feet when the cable is retracted. Cable shall be marked for identification by either painting or embossing during manufacturing process.

3.3.4 Voltage control unit. The voltage control unit shall adapt the 24V truck potential to the 12V trailer requirements. The voltage control unit shall incorporate a rotary selector which, by selective positioning, will insert the required resistance in the marker, clearance, and tail lamp circuit for the various trailer lamp requirements indicated herein. Selector positions shall include resistance values for 8, 10, 12, 14, and 16 lamp circuits of 4 candlepower per each position appropriately marked according to the number of lamps in the circuit. The stop lamp circuits provide for two 21 candlepower lamps. Right and left turn signal circuits shall each provide for one 21 candlepower lamp. The auxiliary circuit shall provide for two 21 candlepower lamps. Circuits shall be based on standard SAE lamp bulb ratings. Resistors shall be of the wire-wound type and rated for the wattage required to be dissipated. All electrical components and wiring shall be mechanically and electrically secure from damage due to severe vibration and shock. The voltage control unit shall be mounted in a weather-resistant, metal enclosure. The enclosure shall be provided with mounting brackets for the purpose of mounting the voltage control unit on military-type towing vehicles.

3.3.5 Circuit continuity. Conductors shall be connected through the voltage control unit to the respective contacts on each cable connector plug, as indicated in table I, to provide continuity of the electrical circuits from the towing vehicle to the towed vehicle.

TABLE I. Interconnection of contacts on respective cable connector plugs.

Circuit function	12-contact plug (MS75020-1)	7-contact plug (SAE J560)	Wire Color
Ground return to towing vehicle	D	1	wht
Marker, clearance, and tail lamps	E	2 and 6	blk & brn
Left turn directional signal	B	3	yel
Stop	F	4	red
Right turn directional signal	J	5	grn
Auxiliary circuit	K	7	blu

3.4 Treatment and painting. Treatment and painting shall be in accordance with the manufacturer's standard commercial practice.

3.5 Identification markings. The cable assembly shall be marked for identification in accordance with MIL-STD-130.

3.6 Workmanship. The cable assembly shall be fabricated in accordance with the current state-of-the-art practices of the industry. Metal surfaces shall be smooth and free from sharp edges. Component parts shall be securely mounted and arranged for accessibility.

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 (examinations and tests) 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 this document where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this document shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in this document shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.1.2 Component and material inspection. Components and materials shall be inspected in accordance with all the requirements specified herein and in applicable referenced documents.

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. The first article inspection shall be performed on one cable assembly when a first article is required (see 3.2 and 6.2). This inspection shall include the examination of 4.4, the tests of 4.5, and, when specified, the first article pack inspection of 4.6 (see 4.6 and 6.2). The first article may be either a first production item or a standard production item from the supplier's current inventory provided the item meets the requirements of the specification and is representative of the design, construction, and manufacturing technique applicable to the remaining items to be furnished under the contract.

4.2.2 Quality conformance inspection. The quality conformance inspection shall include the examination of 4.4, the tests of 4.5, and the packaging inspection of 4.6. This inspection shall be performed on the samples selected in accordance with 4.3.

4.3 Sampling. Sampling and inspection procedures shall be in accordance with MIL-STD-105. The unit of product shall be one cable. All cables offered for delivery at one time shall be considered a lot for the purpose of inspection.

4.3.1 Sampling for examination. Guidance for inspection level and an Acceptable Quality Level (AQL) is provided in 6.5.1.

4.3.2 Sampling for tests. Guidance for inspection level and an Acceptable Quality Level (AQL) is provided in 6.5.2.

4.4 Examination. Each cable assembly selected shall be examined for compliance with the requirements specified in section 3 of this specification. Any redesign or modification of the contractor's standard product to comply with specified requirements, or any necessary redesign or modification following failure to meet specified requirements shall receive particular attention for adequacy and suitability. This element of inspection shall encompass all visual examinations and dimensional measurements. Noncompliance with any specified requirement shall constitute one defect.

4.5 Tests. Each cable assembly selected shall be tested as specified in 4.5.1 through 4.5.3.

4.5.1 Tension test. A straight pull, of not less than 75 pound-force shall be applied continuously, for a period of 1 minute, between jumper cable and each cable connector plug and between jumper cable and the voltage control unit. Following the tension test, each component shall be examined for damage and electrical connections examined to insure that strain relief provisions are adequate to determine conformance to 3.3.

4.5.2 Voltage drop test. A 24V potential shall be applied to the contacts of the 12-contact cable connector plug and the voltage measured in each circuit of the 7-contact cable connector plug, with current flowing in the circuit corresponding to the load requirements of the circuit, to determine conformance to 3.3.4. The minimum voltage at the bulbs shall be not less than 10V.

4.5.3 Continuity test. Cable assembly shall be tested for continuity of the electrical circuit, between corresponding contacts of the cable connector plugs for all circuit conditions, to determine conformance to 3.3.5.

4.6 Packaging inspection. The inspection of the preservation, packing, and marking shall be in accordance with the requirements of section 4 of MIL-C-55442. The inspection shall consist of the quality conformance inspection; and, when specified (see 6.2), a first article pack shall be furnished for examination and test within the time frame required (see 6.2).

5. PACKAGING

5.1 Preservation, packing, and marking. Preservation, packing, and marking shall be in accordance with the requirements of MIL-C-55442 with the level of preservation and the level of packing as specified (see 6.2).

6. NOTES

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

6.1 Intended use. This cable assembly is intended for use to inter-connect the 24V electrical system of a military type towing vehicle with the 12V electrical system of commercial trailers.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.
b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
c. When a first article is required for inspection and approval (see 3.2 and 6.4).
d. When a first article pack inspection is required and time frame required for submission (see 4.2.1 and 4.6).
e. Level of preservation and level of packing required (see 5.1).

6.3 Data requirements. When this specification is used in an acquisition and data are required to be delivered, the data requirements shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved Contract Data Requirements List (CDRL), incorporated into the contract. When the provisions of DoD Federal Acquisition Regulations (FAR) Supplement, Part 27, Sub-Part 27.475-1 (DD Form 1423) are invoked and the DD Form 1423 is not used, the data should be delivered by the contractor in accordance with the contract or purchase order requirements.

6.4 First article. When a first article inspection is required, the item will be tested and should be a first production item or it may be a standard production item from the contractor's current inventory as specified in 4.2.1. The first article should consist of one unit. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examination, test, and approval of the first article.

6.5 Sampling procedures.

6.5.1 Sampling for examination. Recommended inspection level is II and Acceptable Quality Level is 4.0 (see 4.3.1).

6.5.2 Sampling for tests. Recommended inspection level is I and Acceptable Quality Level is 4.0 (see 4.3.2).

6.6 Subject term (key word) listing.

Accessory
Military Vehicles
Truck Tractor

6.7 Changes from previous issue. Asterisks are not used in this revision to changes with respect to the previous issue, due to the extensiveness of the changes.

Preparing Activity:
Navy - YD

(Project 2590-N020)