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16 MAY 1968
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MILITARY STANDARD

ELECTRICAL CIRCUIT (WIRE MARKING) IDENTIFICATION FOR TACTICAL MILITARY VEHICLES

FSC 2920

MIL-STD-646A(AT)
16 May 1968

DEPARTMENT OF THE ARMY
Army Materiel Command
Washington, D. C.

Electrical Circuit Number Identification for Military Vehicles.
MIL-STD-646A(AT)

1. This military standard is approved by the U. S. Army Tank-Automotive Command, Department of the Army and is mandatory for use by that activity on all new equipment. All other military activities are required to employ this standard where suitable. Application of the standard to current production or prior produced vehicles shall be accomplished to the maximum extent possible without affecting major changes to existing components or wiring systems and where expenditure involved can be justified by the end usage of the vehicle. When practicable, consideration should be given to partial application of the standard particularly for ignition (distributor/spark plug) cables and the cables between generator and regulator.

2. Recommended corrections, additions or deletions should be addressed to the Commanding General, U. S. Army Tank-Automotive Command, Warren, Michigan 48090.

FOREWORD

The intent of this standard is to establish a means of identifying vehicular (non-combat type) electrical circuits and wires.

Each wire will be marked adjacent to the wire end. The marking system is based on letters assigned to electrical components and letters indicating the component terminal to which the wire is attached. The method is considered to have merit in that field maintenance personnel should be able to accomplish vehicle wiring with minimal training and reference to wiring diagrams.

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TABLES

FIGURES

1. SCOPE

1.1 Purpose. The purpose of this standard is to provide a simplified cable identification system for service vehicles based on terminal markings.

1.2 Scope. This standard covers a method of identifying wires connecting components in electrical circuits of service vehicles based on wire end markings which identify the component and the terminal to which the wire end is connected.

2. REFERENCED 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 standard to the extent specified herein.

SPECIFICATION
Military
MIL-T-14379 - Tape, Pressure Sensitive, Adhesive: Electrical Circuit Marker, Automotive.

STANDARDS
Military
MS-39020 - Band, Marker, Blank.

3. DEFINITIONS

3.1 General. For the purpose of this standard, the following definition shall apply:

3.1.1 Component. A component is an article which is normally a combination of parts, subassemblies, or assemblies, and is a self-contained element of a complete piece of operating equipment and performs a function necessary to the operation of that equipment.

3.1.2 Electrical circuit. An electrical circuit consists of all components of a given basic group together with their connecting wires and grounds.

3.1.3 Electrical component. An electrical component is a piece of vehicular equipment intended to generate, distribute, alter, consume or store electrical energy or effect an electrical connection or disconnection.

3.1.4 Electrical wire. An electrical wire is a single current path established by a strand or strands of electrical conductors connected

between components, or between a component and ground.

3.1.5 Marking. Marking refers to letter combinations applied to non-deteriorating tags and marker bands for circuit and wire identification.

4. GENERAL REQUIREMENTS

4.1 Tags and marker bands. Tags and marker bands used for circuit and wire identification shall when possible conform to MIL-T-14379 or MS39020 but are not restricted thereto. The marking shall remain legible after the tag has been subjected to any environmental coatings (i.e. paint, primer, varnish, lacquer, fuel, lubricants) and all climatic conditions encountered in normal operation.

4.2 Marking. The markings shall be applied to tags or marker bands adjacent to the wire ends and shall consist of upper case letters based on component and component terminal to which the wire is connected (see 5.1, 5.2, and table I).

5. DETAIL REQUIREMENTS

5.1 General. Tagging and marking of electric wire ends shall be in accordance with 4.1 and 4.2. Component coding and terminal marking shall be in accordance with 5.2 and table I.

5.2 Three letter marking. In general marking shall follow the sample format:

GEA

The first two letters shall indicate the component (see table I) to which the wire is to be connected. The next letter shall indicate the terminal on the component to which the cable is to be connected. This marking at the end of a cable indicates that the cable end marked "GEA" is connected to the generator at the "A" terminal on the generator.

5.2.1 Two letter marking. Where the component is component-grounded and has but a single terminal or point of connection, the terminal marking shall be omitted. Thus the cable end marked "HM" is connected to the single terminal on the heater motor.

5.2.2 One letter components. Several components (see table I) shall be identified by a single letter. Those are components that may appear several times in a vehicle electrical system. The second letter shall designate a further identification of the component. Thus a vehicle with four connectors in its electrical system shall have the four connectors

marked "CA", "CB", "CC", and "CD". Terminals on these connectors shall have the normal alphabetical identification. Thus a cable end marked "CCC" shall be attached to the "C" terminal on connector "CC". The letter "Q" shall be omitted from the alphabetical sequence for both terminals and the second letter (sequence) on the connectors.

5.2.3 Ignition cable marking. Ignition cables shall be marked with arabic numerals in lieu of alphabetical letters to identify the engine cylinder serviced. As an example, an ignition cable end marked "SP3" shall have the marked end attached to the spark plug on No. 3 cylinder. The other end of this cable shall be marked "D3" and shall be inserted at the No. 3 engine contact on the distributor cap. The distributor shall have the engine contacts numbered in firing order around the distributor cap.

5.2.4 Battery marking. Cables attaching at the positive post of the battery shall be marked "B+". Cables attaching at the negative post shall be marked "B-".

5.2.5 Multiple components. When several units of a component identifiable by two letters are used in a particular vehicle these shall be identified by using a dash (-) and an arabic numeral. Thus the third bilge pump used on a vehicle shall be identified by "BP-3". It will be noted that no terminal marking is indicated in this case inasmuch as the bilge pump is component grounded. The cable connecting at the "A" terminal of the regulator for the auxiliary generating system used on vehicle shall be marked "GEA-2".

5.3 Installation of tags and marker bands. The prime requirement in the installation of tags is that the tags be so placed as to preclude any possibility of short circuiting. Where possible, tags and marker bands shall be placed in the area within one quarter of an inch to two inches of the ends of the insulation of the wire.

5.4 Illustrative wiring diagrams. The wiring diagram depicted in figure 1 is illustrative of most of the elements of the identification system.

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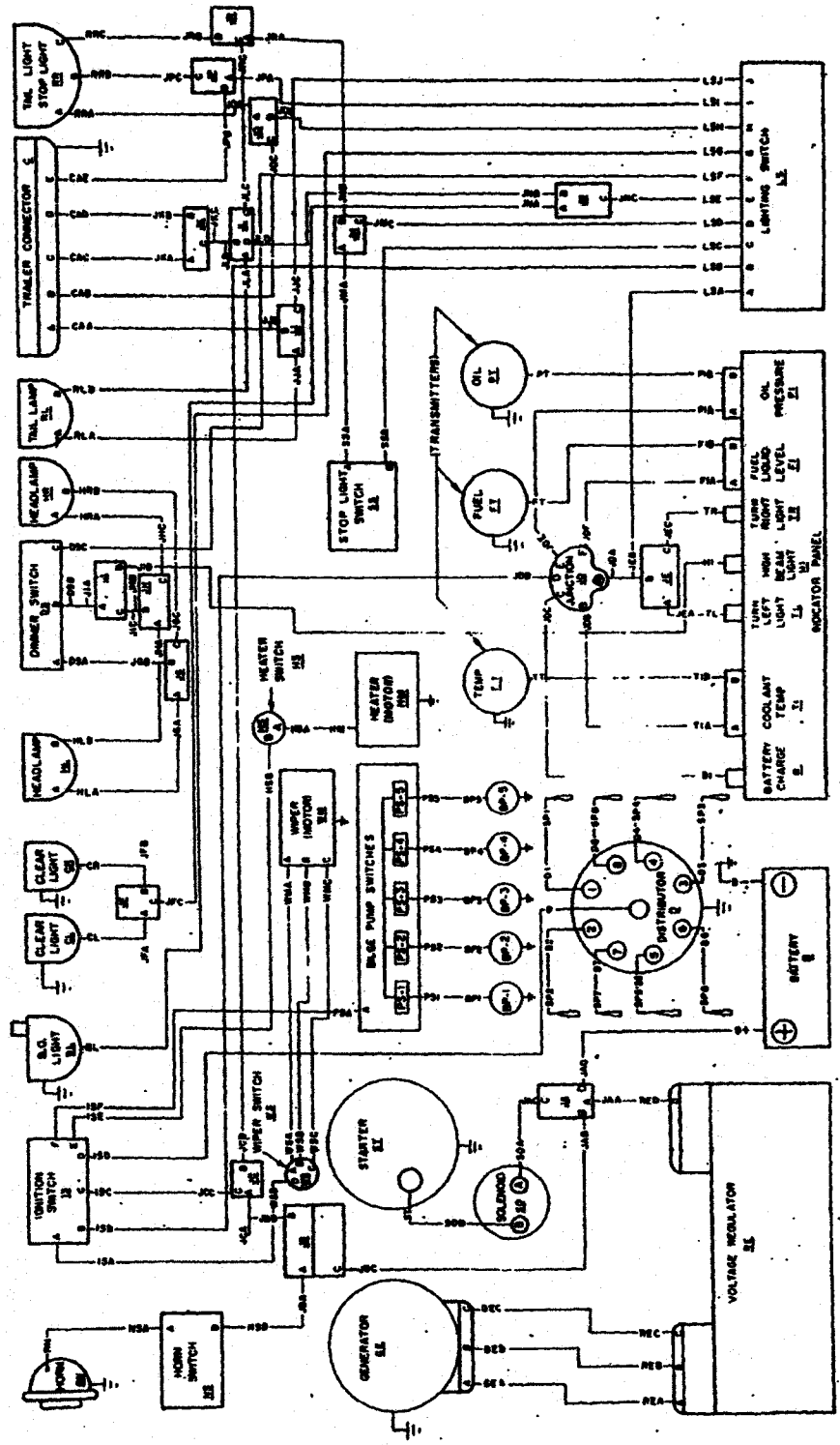
TABLE I - Letters Assigned to Components

Components	Letter(s) (Code)
1. GENERATOR STARTER	
Generator	GE
Regulator	RE
Starter	ST
Solenoid (Starter)	SO
2. LIGHTS	
Headlight-Left	HL
Headlight-Right	HR
Highbeam Light	HI
Tail Light (Right) (rear light) Stoplight	RR
Tail Light (Left) (rear light) Stoplight	RL
Turnlight-Right	TR
Turnlight-Left	TL
Light Clear-Right	CR
Light Clear-Left	CL
Blackout Light	BL
3. SWITCHES	
Dimmer Switch	DS
Ignition Switch	IS
Stoplight Switch	SS
Heater Switch	HS
Horn Switch	NS
Wiper Switch	WS
Bilge Pump Switch	PS
Lighting Switch	LS
4. INSTRUMENTS	
Battery Charge Indicator	BI
Fuel Indicator - Liquid Level	FI
Fuel Transmitter - Liquid Level	FT
Pressure Indicator - Oil	PI
Pressure Transmitter - Oil	PT
Temperature Indicator - Coolant	TI
Temperature Transmitter - Coolant	TT

TABLE I - Letters Assigned to Components (Continued)

Components	Letter(s) (Code)
5. ACCESSORIES	
Heater (Motor)	HM
Horn	RN
Wiper (Motor)	WM
Bilge Pump	BP
6. SINGLE LETTER COMPONENTS	
Battery	B
Distributor	D
Connector	C
Junction Box	J



ILLUSTRATIVE TRUCK WIRING DIAGRAM
FIGURE I

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