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SAE J1493 DEC86

Shielding of Starter System Energization

SAE Standard
Issued December 1986

Submitted for Recognition as
an American National Standard

SAE The Engineering Society For Advancing Mobility Land Sea Air and Space

400 COMMONWEALTH DRIVE, WARRENDALE, PA 15096

OFF-HIGHWAY MACHINERY STANDARD

Submitted for recognition as an American National Standard

SAE J1493

Issued 12-86

SHIELDING OF STARTER SYSTEM ENERGIZATION

1. PURPOSE AND SCOPE: This SAE Standard describes the shielding requirements for the starter motor solenoid and starter motor relay if so equipped on off-road self-propelled work machines, as identified in SAE J1116.

   The shielding shall prevent inadvertent electrical connection at the starter motor solenoid or relay and/or discourage deliberate connection circumventing interlock features, during normal operation and/or servicing as prescribed by the operation or service manual.

2. DEFINITIONS:

2.1 Starter motor solenoid is the integral control device which energizes the starter motor. (See Fig. 1)

2.2 The starter motor relay is the control device which energizes the starter motor solenoid. (See Fig. 1)

2.3 The coil terminal is the terminal used to energize the coil of either the starter relay and/or the starter motor solenoid, Terminal Nos. (1) and (4) in Fig 1.

2.4 The battery terminal is the terminal used to supply battery power to the starter relay or the starter motor solenoid, Terminal Nos. (2) and (5) in Fig 1.

2.5 The solenoid terminal is the terminal on the relay used to transfer power to the starter motor solenoid after the starter relay has been energized, Terminal No. (3) in Fig 1.

2.6 The motor terminal is the terminal on the solenoid used to transfer power to the motor after the starter motor solenoid has been energized, Terminal No. (6) in Fig 1.

3. GENERAL REQUIREMENTS:

3.1 Prevent inadvertent electrical connection on the starter motor solenoid between the battery terminal (5) and the coil terminal (4) or the battery terminal (5) and the motor terminal (6).

3.2 Prevent inadvertent electrical connection on the starter motor relay between the battery terminal (2) and the coil terminal (1) or between the battery terminal (2) and the solenoid terminal (3).

3.3 On the starter motor solenoid, the battery terminal (5) shall be shielded from the coil terminal (4) and from the motor terminal (6) by means of a removable protective cover.

3.4 On the starter motor relay, the battery terminal (2) shall be shielded from the coil terminal (1) and from the solenoid terminal (3) by means of a removable protective cover.

3.5 All shielding materials to be non-conductive.

3.6 The starter motor solenoid and relay shall be equipped with a permanent barrier separating the terminals. This shall provide minimal protection when the removable protective cover is not in place.

3.7 The removable protective cover shall require hand tools to remove from the starter relay and/or the starter motor solenoid.

4. PERFORMANCE REQUIREMENTS:

4.1 The shielding materials shall be considered non-conductive if they meet the following test:

Dielectric Test - The shielding materials shall have metallic foil placed on opposite sides of the material. A potential of 1500 volts A-C shall be applied to the metallic foil. There shall be no evidence of electric breakdown or flashover. The maximum leakage current shall not exceed 2 mA.

4.2 The removable protective covers shall protect against terminal to terminal connection when any rigid conductor (i.e., screwdriver, pliers, etc.) is utilized.

4.3 The permanent barrier shall protect against terminal to terminal connection when a flat rigid conductor (i.e., screwdriver) is utilized.

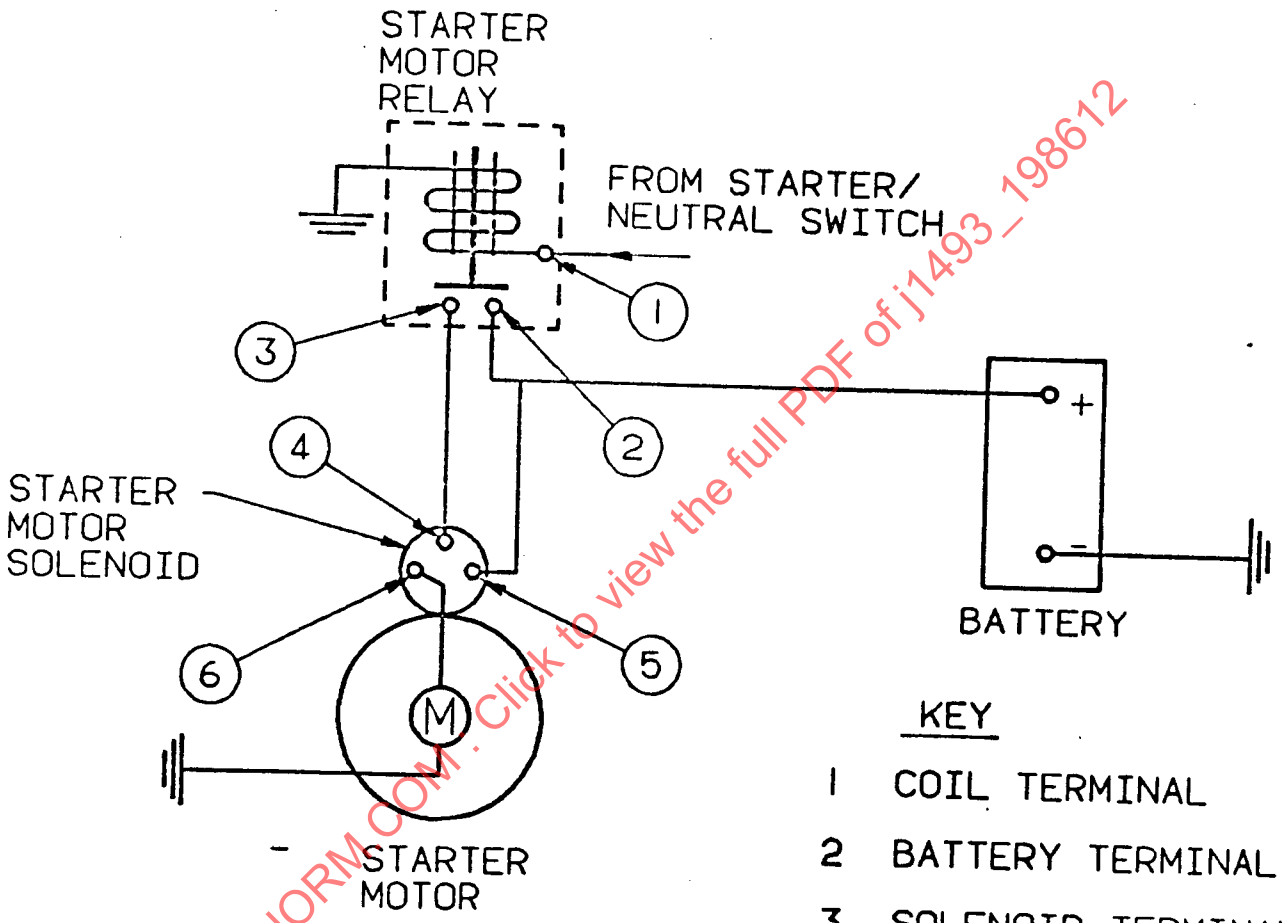

FIG. 1 - TYPICAL CRANKING CIRCUIT

RATIONALE:

Not applicable.

RELATIONSHIP OF SAE STANDARD TO ISO STANDARD:

Not applicable.

REFERENCE SECTION:

SAE J1116 JUN86, Categories of Off-Road Self-Propelled Work Machines

APPLICATION:

This standard describes the shielding requirements for the starter motor solenoid and starter motor relay if so equipped on off-road self-propelled work machines, as identified in SAE J1116.

The shielding shall prevent inadvertent electrical connection at the starter motor solenoid or relay and/or discourage deliberate connection circumventing interlock features, during normal operation and/or servicing as prescribed by the operation or service manual.

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