

NAVSEA
STANDARD ITEM

FY-18

ITEM NO: 009-36
DATE: 18 NOV 2016
CATEGORY: II

1. SCOPE:

1.1 Title: Controller; repair

2. REFERENCES:

2.1 Standard Items

2.2 Equipment Technical Manual

2.3 S9086-KC-STM-010/CH-300, Electric Plant - General

2.4 MIL-STD-2003, Electric Plant Installation Standard Methods for Surface Ships and Submarines

2.5 S9300-A6-GYD-010, Electrical Workmanship Inspection Guide for Surface Ships and Submarines

2.6 MIL-STD-1310, Shipboard Bonding, Grounding, and Other Techniques for Electromagnetic Compatibility, **Electromagnetic Pulse (EMP) Mitigation**, and Safety

3. REQUIREMENTS:

3.1 Identify and pull back associated cables. Disconnect mechanically and remove controller.

3.1.1 Matchmark, identify, and retain shims.

3.1.2 Inspect each foundation for cracks, areas of distortion, and deterioration in excess of 25 percent of the thickness of each member of the structure.

3.1.2.1 Submit one legible copy, in approved transferrable media, of a report listing results of the requirements of 3.1.2 to the SUPERVISOR.

3.1.3 Accomplishment of cleaning and painting for foundations of equipment removed in 3.1 shall be in accordance with NAVSEA Standard Items (See Note 4.2).

3.2 Disassemble each controller and clean components free of foreign matter.

3.3 Inspect each controller enclosure, mounting board, and component for mechanical and physical defects, improper values, and internal wiring for conformance to 2.2 and controller wiring diagram.

3.3.1 Test internal wiring and each coil for open circuits. Test insulation resistance to ground and between conductors, using a 500-volt megger. Record readings. Minimum acceptable resistance to ground shall be one megohm.

3.3.1.1 Disconnect solid-state devices prior to measuring insulation resistance.

3.3.2 Submit one legible copy, in approved transferrable media, of a report listing results of the requirements of 3.3 and 3.3.1 to the SUPERVISOR.

3.4 Repair each controller, using 2.2 for guidance.

3.4.1 Straighten each enclosure and door. Free-up hinges and align door. Plug and seal unused cable openings.

3.4.1.1 Install ground straps on each door on controllers with door mounted energized components in accordance with MIL-E-2036 in place of those **identified** to be missing or defective.

3.4.2 Accomplishment of cleaning and painting of the interior and exterior of the enclosure shall be in accordance with NAVSEA Standard Items (See Note 4.2).

3.4.3 Remove existing and install new enclosure gaskets.

3.4.4 Remove existing and install new door fasteners in place of those **identified** to be missing or defective. Install new door fasteners where missing.

3.4.5 Remove existing and install new molded-rubber switch covers.

3.4.6 Remove existing and install new components in place of those **identified** to be missing, defective or of improper value. Remove existing and install new wiring in place of wiring **identified** to be defective or frayed. Install new wiring where missing.

3.4.7 Inspect, dress, and adjust contacts.

3.4.7.1 Install new contacts in place of those **identified** to be missing or defective, or resilver contacts in accordance with ASTM B 700.

3.4.8 Remove existing cadmium-plated parts and install new zinc-plated parts in accordance with ASTM A 153.

3.4.9 Wash, dip and bake, tape insulated coils and open transformers. Dipping shall be in varnish conforming to MIL-I-24092, Class 155.

3.4.9.1 Dip and bake coils and open transformers in Dolph 1105, Epoxylite Esterlite 605, or Schenectady International Isolite 862M varnish in localities where MIL-I-24092 varnish does not meet state and local Air Pollution Control District (APCD) Standards.

3.4.9.2 Repair and reinsulate coil and transformer leads.

3.4.10 Free-up and lubricate moving parts.

3.4.11 Adjust timing devices, relays, and contactors.

3.4.12 Repair defective connections.

3.4.13 Install a new wiring diagram and new heater table in each controller. The new diagram shall reflect actual configuration of the controller in which it is installed. New diagrams shall be sealed in transparent plastic and shall be mounted on the inside of each controller so as to be conveniently accessible.

3.5 Assemble each controller.

3.5.1 Dress and shape wiring and wire harnesses for neat appearance. Install wire clamps on both ends of wire hinges. Install flexible insulating tubing over wire hinges to prevent chafing.

3.5.2 Install new threaded fasteners, washers, and lockwashers in place of those **identified** to be missing or defective.

(V) "SHOP OPERATIONAL TEST"

3.6 Accomplish an operational test of each controller and adjust to ensure correct operation in accordance with the wiring diagram of 3.4.13, using 2.2 for guidance.

(V) "INSULATION RESISTANCE TEST"

3.6.1 Accomplish 500-volt megger insulation resistance test, using Paragraphs 300-3.2.2 through 300-3.2.3, 300-3.4.8, 300-3.4.11, and 300-5.3.7.1 of 2.3 for guidance.

3.7 Install each controller using shims retained in 3.1.1 and **new fasteners**.

3.7.1 Remove existing and install new conductor identification sleeving in place of conductor identification sleeving *identified* to be illegible or missing. New conductor identification sleeving shall conform to SAE-AMS-DTL-23053, Class One, white, marked with indelible ink.

3.7.2 Repair and reinsulate cable ends terminating in the controller in accordance with Part One of 2.4. Resleeve conductors over 9,000 circular mils.

3.7.3 Remove defective and install new lugs, using 2.5 for accept or reject criteria. Install new lugs where missing. New lugs shall conform to MIL-T-16366 or SAE-AS7928

3.7.4 Bond and ground equipment in accordance with 2.6.

3.8 Connect each controller with the exception of the motor leads and the brake leads if applicable, using retained data of 3.1.

(V) "PRELIMINARY SEQUENCE TEST"

3.8.1 Accomplish a preliminary sequence test of each controller by cycling the controller through 3 start and stop cycles from each local and remote pushbutton station. Observe controller for proper sequence. Correct deficiencies.

3.8.2 Connect the motor leads and brake leads, if applicable, at completion of preliminary sequence test.

(V) (G) "OPERATIONAL TEST"

3.9 Accomplish an operational test of each controller with its associated motor for designed sequence of operation. Verify correct speed selection, correct motor rotation in each mode, and correct value of overload setting or size of heater coils based on motor nameplate full load running current.

4. NOTES:

4.1 Equipment technical manual and drawings will be listed in the invoking Work Item.

4.2 If cleaning and painting of 3.1.3 or 3.4.2 is required; the use of Category II Standard Item 009-32 "Cleaning and Painting Requirements; accomplish" **of 2.1** will be specified in the Work Item.