

NAVSEA
STANDARD ITEM

FY-19 CH-4

ITEM NO: 009-17
DATE: 31 AUG 2018
CATEGORY: II

1. SCOPE:

1.1 Title: Rotating Electrical Equipment; repair

2. REFERENCES:

2.1 Standard Items

2.2 Equipment Technical Manual

2.3 S9086-DA-STM-010/CH-100, Hull Structures

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

2.5 S9086-KE-STM-010/CH-302, Electric Motors and Controllers

2.6 S9086-KN-STM-010/CH-310, Electric Power Generators and Conversion Equipment

2.7 S9086-HN-STM-010/CH-244, Propulsion Bearings and Seals

2.8 S6260-BJ-GTP-010, Electrical Machinery Repair, Electric Motor, Shop Procedures Manual

2.9 MIL-DTL-17060, MOTORS, ALTERNATING CURRENT, INTEGRAL-HORSEPOWER, SHIPBOARD USE

2.10 S9310-AC-HBK-010, Commutator/Slip Ring Maintenance Handbook

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

2.12 407-5291780, Standard Electromagnetic Interference (EMI) Survey Procedures

3. REQUIREMENTS:

3.1 Disconnect equipment mechanically and remove, including rotating components connected directly to the shaft, using 2.2 for guidance.

3.1.1 Accomplish the following prior to disconnecting: measure air gap readings; measure bearing clearances for sleeve bearing equipment only; measure alignment readings; inspect couplings for cracks, broken segments, wear, and misalignment in excess of tolerances specified in 2.2; measure shaft thrust and run out readings; identify associated cables/wiring and hook-up data. Record data.

3.1.2 Identify associated cables and wiring. Disconnect equipment mechanically, using 2.2 for guidance. Record list of accessories.

3.1.3 Remove entire vaneaxial and tubeaxial fan assemblies from the duct system and transport to the shop for repair.

3.2 Accomplish a structural inspection of each foundation in accordance with 2.3. Record data.

3.2.1 Accomplishment of cleaning and painting requirements for foundations of equipment shall be in accordance with NAVSEA Standard Items (See 4.9).

3.3 Matchmark, disassemble, inspect, measure, and test the equipment removed in 3.1, using 2.2 and 2.4 through 2.8 for guidance.

3.3.1 Inspect and dimensionally measure end bells, frame, rabbet fits, shaft, sleeve and pedestal bearings, keyways, fan and running surfaces for wear, eccentricity, and other defects, using 2.2 for accept or reject criteria, and 2.7 for location and type of measurements to be taken. Record data.

3.3.2 Accomplish a 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 2.4 for guidance. Record data.

3.3.2.1 Disconnect solid-state devices and ground temperature-sensing leads prior to measuring insulation resistance of windings.

3.3.3 Accomplish a phase resistance balance test of windings, using a Wheatstone or Kelvin bridge, or with an ohmmeter capable of resolving one milliohm (0.001 ohm). Record phase balance for multi-phase equipment, using Paragraph 5.2.1 of 2.8 and 3.6.1 of 2.9 for guidance. Record data.

3.3.4 Accomplish a voltage surge test in accordance with Paragraphs 300-3.5.4 through 300-3.5.5 of 2.4. Record data.

3.3.5 Accomplish a DC HI POT test in accordance with Paragraph 300-3.5.2 through 300-3.5.2.3.4 of 2.4. Record data.

3.3.6 Accomplish a Polarization Index Test in accordance with Paragraph 300-3.4.12 of 2.4. Record data.

3.3.7 Measure resistance value of each winding temperature detector, heater, and heater strip using low voltage ohmmeter. Record data.

3.4 Clean, dry, and test the equipment and windings.

3.4.1 Clean in accordance with Paragraphs 300-4.5.1 through 300-4.5.5 of 2.4.

3.4.2 Dry by placing in an oven in accordance with Paragraph 300-5.3.2.3 of 2.4. Allow to cool to ambient temperature.

3.4.3 Repeat 3.3.2 and 3.3.5 tests. Record data.

3.4.4 Repeat cleaning, drying, and testing in 3.4.1 through 3.4.3 if DC HI POT test readings are questionable, or if insulation resistance readings (minimum of 500 Meg Ohms for motors with a VPI Sealed Insulation System) are not in accordance with the following: DC generators and motors (except propulsion and auxiliary generators for submarines) including exciters, Table 300-3-64 of 2.4; DC propulsion generators and motors and DC auxiliary generators for submarines, Table 300-3-7 of 2.4; AC generators and motors other than propulsion, Table 300-3-8 of 2.4; AC propulsion generators and motors, Table 300-3-9 of 2.4. Record data. (See 4.5)

3.4.5 Repeat 3.4.1 through 3.4.3 if satisfactory readings are not obtained after the second cleaning. Record data. (See 4.5)

3.4.6 Notify the SUPERVISOR if satisfactory readings are not obtained after a third cleaning.

3.4.7 Repeat 3.3.3 and 3.3.4 tests. Record data. (See 4.5)

3.5 Protect the windings and machined surfaces. Accomplishment of cleaning and painting requirements for equipment housing exterior, including fan(s) and interior and exterior of each end bell shall be in accordance with NAVSEA Standard Items. (See 4.9)

3.6 Inspect and test non-wound rotors for loose or cracked bars, localized overheating, and rubbing in accordance with 2.8. Inspect wound rotors, slip ring leads, and armatures for insulation damage and burns/hot spots. Inspect for loose coils and slot wedges. Inspect slip rings and commutators for damage and for wear limits, using 2.2 for criteria. Inspect brush rigging for cracks, chips, worn areas, distortion, spring condition, and insulating material for cracks and arc paths. Inspect leads and terminal lugs for damage and defects. Identify and tag leads with aluminum wrap-around bands with metal stamped or embossed markings. Record data.

(V) "VARNISH TEMPERATURE, VISCOSITY, AND GEL TIME TESTS"

3.7 Select the proper insulating process based on winding insulation classifications and to meet state or local air pollution standards. Select varnish methods and material, using Paragraphs 300-4.5.8 through 300-4.5.8.2 of 2.4 for guidance. Maintain the varnish in accordance with Paragraphs 300-4.5.8.3 through 300-4.5.8.3.3 of 2.4 and the varnish manufacturer's instructions. Maintain a current revision of the varnish manufacturer's instructions on storage, maintenance, and use of the type of varnish to be applied. Maintain a record of varnish temperature, viscosity and, for solventless varnish, gel time tests. Tests must show varnish is within varnish manufacturer's recommendations and have been accomplished in the intervals specified by the varnish manufacturer. The record must also show that the varnish is being stored as recommended by the varnish manufacturer. (See 4.5)

3.8 Varnish and bake windings in accordance with Paragraphs 300-4.5.8.4 of 2.4 and the varnish manufacturer's instructions. Do not immerse the leads. Wipe surfaces that affect assembly, such as rabbet fits and mounting flanges, with a cloth moistened with a solvent after draining and before baking. Remove excess varnish run-off from **surfaces that affect assembly** after baking. Apply a thin coat of air-dry varnish to metal surfaces exposed by the removal process in accordance with Paragraph 300-4.5.8.5 and 300-4.5.8.6 of 2.4. (See 4.5)

3.9 Repeat tests described in 3.3.2 through 3.3.5. Record data. (See 4.5)

3.10 Accomplish an AC HI POT test in accordance with Paragraphs 300-3.5.3 through 300-3.5.3.2.9 of 2.4. Record data. (See 4.5)

3.11 Repeat measurements described in 3.3.7. Record data.

3.12 True the commutator or collector rings. Eccentricity shall not exceed the requirements of 2.10. Resurface or machine each individual collector ring to the same exact diameter to allow symmetrical brush holder to ring clearance spacing. Ensure metal shavings are not permitted to contaminate the rotor or stator assembly. Each cut shall not exceed 0.010 inch. Finish thickness shall not be less than design wear tolerance as shown in 2.2. Undercut the mica between the commutator bars with the edge of the mica not exceeding a depth of 5/64-inch below the bars. Chamfer the bar edges and remove rough surfaces in accordance with Paragraph 7-4.1.3 of 2.9. Burnish the commutator with a very fine commercial burnishing stone conforming to A-A-58052. Polish collector rings to a mirror finish.

3.13 Accomplishment of the balancing requirement for each rotating assembly shall be in accordance with NAVSEA Standard Items. (See 4.8)

3.14 Disassemble the brush rigging. Remove foreign matter. Replace existing cadmium-plated parts with zinc in accordance with ASTM A 153. Recondition threads of plated parts. Assemble brush rigging.

3.15 Repair lightly scored areas of frame, end bells, and shaft by manual methods. Recondition threads and fit key to keyway. Visually inspect keyway for deformed, cracked or chipped edges or high spots. Verify that fit between key and key-seat sides has a minimum clearance of 0.002 inch or maximum interference of 0.0005 inch. High spots in keyway may be removed by machining or grinding. Do not unnecessarily repair any keyway; instead, use a step key up to a maximum of 0.010 inch oversize and, where possible, include a radius in step. If key tightness cannot be corrected with a step key, re-machine worn/damaged keyways to recommended over-sizes as follows: Maximum of 0.015 inch oversize for a 1/8-inch key and increasing oversize allowance of 0.010 inch for each 1/8-inch increase in key size up to a maximum of 0.075 inch. If key tightness cannot be corrected by keyway repair, replace part involved. Apply a thin coat of petrolatum to unpainted mating surfaces except for explosion-proof motors, which shall have clean, dry mating surfaces.

3.16 Prepare and refinish equipment. Protect machine surfaces, windings, and nameplates from being painted or otherwise damaged.

3.16.1 Accomplishment of cleaning and painting requirements for housing, fan, and interior and exterior of each end bell shall be in accordance with NAVSEA Standard Items (See 4.9).

3.17 Accomplish the following on equipment having other than sleeve-type bearings unless otherwise specified in the invoking Work Item, using 2.8 for guidance.

3.17.1 Install new bearings, seals, fittings, lock washers, and locknuts conforming to 2.2, using 2.7 and Chapter 6 of 2.8 for guidance, except as indicated in 3.17.1.1 (utilizing Attachment A for guidance).

3.17.1.1 Install Type 111, Class 8 (double seal), bearings in motors meeting the criteria identified in Chapter 6 of 2.8. Only double seal bearings identified in Chapter 6 of 2.8 are acceptable for use.

3.17.1.2 Install Type 111, Class 8 (double seal), bearings with a C3 (greater than normal) radial internal clearance, if not originally furnished or already accomplished during previous repair, in place of the Type 111 bearing originally furnished, for vaneaxial and tubeaxial fan motors not meeting the criteria of Chapter 6 of 2.8. Install Type 120 bearings in vaneaxial and tubeaxial fan motors originally furnished with Type 120 bearings.

3.17.1.3 Install new label plates with the inscription "DO NOT LUBRICATE" on equipment using double seal bearings (Type 111, Class 8, or Type 120).

3.17.1.4 Install pipe plugs on all grease fills and drains, for equipment converted from re-lubricable bearings to double seal bearings.

3.17.1.5 Prepare a report that reflects the change in the maintenance requirements for the converted motor, for equipment converted from lubricated bearings to double seal bearings.

3.17.2 Lubricate bearings with grease conforming to DOD-G-24508 in accordance with Paragraphs 244-1.7.7.2 and 244-1.7.7.3 of 2.7, for equipment not using double seal bearings.

3.18 Assemble the equipment using 2.2 and 2.4 through 2.8 for guidance. Do not use materials containing silicone in the repair and assembly of equipment with commutator or collector rings. Install new gaskets on covers, inspection plates, and between the external connection box and the frame. Gaskets shall conform to MIL-PRF-1149 unless otherwise specified in 2.2. Set brush holders not less than 1/16-inch or more than 1/8-inch from commutator or collector rings unless otherwise specified in 2.2; set in electrical neutral plane and stagger brushes for maximum coverage of the commutator, in accordance with Paragraph 300-4.7.7.1.10 of 2.4; center over the collector rings; ensure the brushes do not extend beyond the edge of the collector rings; install new brushes in accordance with 2.2; sand new brushes to fit curvature of the commutator or collector rings in accordance with Paragraph 6-3.5 through 6-3.5.4 of 2.10; ensure brushes have a surface contact of 100 percent and are not chipped, cracked, or broken; remove sand, carbon, and other foreign matter resulting from fitting new brushes; adjust spring tension of brushes in accordance with 2.2. Adjust air gap as specified in 2.2, plus or minus 10 percent. Rotate shaft by hand a minimum of 3 revolutions. Rubbing or binding of rotating assembly shall not be allowed.

3.18.1 Install label plates conforming to MIL-DTL-15024 for those identified to be missing or damaged.

3.18.2 Install identification markers on wiring in the external connection box. Ensure markers shall be aluminum wrap-around type with metal stamped or embossed markings.

3.18.3 Inspect equipment for applicable electromagnetic interference (EMI) fixes using Shipboard Electromagnetic Compatibility Improvement Program (SEMCIP) Technical Assistance Network (STAN) in accordance with 2.12. Record results.

3.19 Accomplish a no-load shop test of the motor for a minimum of one-half hour. Verify proper direction of rotation. After one-half hour, measure current and voltage in each phase, speed and bearing temperature rise measured on the equipment's exterior near each bearing. Record data.

3.20 Accomplish an operational test, with the vaneaxial/tubeaxial fan reassembled for one hour after bearing and stator temperatures stabilize

within one degree Celsius for 3 consecutive 15-minute intervals. Verify proper direction of rotation. Measure current, voltage, frame and bearing temperature rise and speed at 15-minute intervals. Bearing temperatures shall not exceed 180 degrees Fahrenheit, unless otherwise specified in the invoking Work Item or equipment technical manual. Measure hot insulation resistances of winding to ground immediately upon completion of the operational shop test, using a 500-volt megger. Record data.

3.21 Submit one legible copy, in approved transferrable media, of a report listing results of the requirements of 3.1.1, 3.1.2, 3.3 through 3.3.7, 3.4.3, 3.4.4, 3.4.5, 3.4.7, 3.6, 3.10, 3.11, 3.17.1.5, 3.18, and 3.20 to the SUPERVISOR.

3.22 Install equipment. Install new gaskets conforming to MIL-PRF-900 on disturbed ventilation. Align in accordance with 2.2. Measure and record facial and peripheral coupling data. Install chocks, shims, shock mounts, sound damping pads, and other accessories. Connect electrical cables/wiring. Bond and ground equipment in accordance with 2.11, using new ground straps. Rotate shaft by hand a minimum of 3 revolutions. Rubbing or binding of rotating assembly shall not be allowed. Measure the air gap and bearing clearance (sleeve bearing equipment only), insulation resistance (at 500 volts DC), and thrust. Record data.

3.22.1 Accomplishment of pump and driver shaft alignment shall be in accordance with NAVSEA Standard Items. (See 4.910)

(V) (G) "OPERATIONAL TEST"

3.23 Accomplish an operational test of the assembled equipment at full system capacity for one hour after bearing and stator temperatures stabilize within one degree Celsius for 3 consecutive 15-minute intervals, unless otherwise specified in the invoking Work Item. When temperatures do not stabilize in four hours, stop test and contact the SUPERVISOR. Verify proper direction of rotation. Verify/establish oxide film coating of the commutator/collector rings, using 2.9 for guidance. Measure current, voltage, frame and bearing temperature rise, and speed at 15-minute intervals. Frame and bearing temperature rise and speed is not required for vaneaxial and tubeaxial fan assemblies. Bearing temperatures shall not exceed 180 degrees Fahrenheit, unless otherwise specified in the invoking Work Item or equipment technical manual. Record data.

3.23.1 Accomplish the requirements of 3.23 twice for two speed motors, once while operating at low speed, and once while operating at high speed.

3.23.2 Accomplish the requirements of 3.23 for limited duty motors, for a period of time equal to the duty cycle of the motor. For motors with a duty cycle equal to or less than 30 minutes, measure data every 10 minutes.

3.23.3 Measure hot insulation resistances of windings to ground immediately upon completion of test, using a 500-volt megger.

3.24 Submit one legible copy, in hard copy or approved transferrable media, of a report listing data recorded in 3.22, and 3.23 through 3.23.3 to the SUPERVISOR.

4. NOTES:

4.1 Equipment technical manual, Allowance Parts List (APL) (if applicable) and drawings will be listed in the invoking Work Item.

4.2 Shop test of generator will be addressed in the invoking Work Item.

4.3 The purpose of 3.4.4, 3.4.5, 3.4.7, 3.7, 3.8, 3.9, and 3.10 is to ensure the integrity of motors with a VPI Sealed Insulation System.

4.4 Utilize Attachment A for determination if the Navy's motor bearing conversion program for Extended-Life Double Seal (ELDS) ball bearings is permissible).

4.5 Not required for motors with a VPI Sealed Insulation System.

4.6 MIL-B-17931 (Bearings, Ball, Annular, for Quiet Operation) bearings are considered to be Long Lead Time (LLT) material. It is recommended these bearings be provided as Government Furnished Material (GFM).

4.7 Data received in 3.17.1.5 shall be used by the SUPERVISOR for the purpose of initiating action ensuring shipboard databases such as the Equipment Guidance List (EGL) are updated to reflect the change in maintenance requirements for converted motors. Additionally, where APL changes are initiated to convert to ELDS bearings, a COSAL feedback report shall be submitted, providing the NSN and part number for the ELDS bearing by the SUPERVISOR. Utilize the following website to initiate changes to Technical Manuals, APLs, etc.: <http://www.navy311.navy.mil>.

4.8 If balancing of rotating equipment of 3.13 is required; the use of Category II Standard Item 009-15 "Rotating Machinery; balance" of 2.1 will be specified in the Work Item.

4.9 If cleaning and painting of 3.2.1, 3.5, or 3.16.1 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.

4.10 If pump and driver shaft alignment of 3.22.1 is required, the use of Category II Standard Item 009-58 "Pump and Driver Shaft Alignment; accomplish" of 2.1 will be specified in the Work Item.

4.11 Shipboard Electromagnetic Compatibility Improvement Program (SEMCIIP) Technical Assistance Network (STAN) referred to in 3.18.3 is available at <https://semcip.nswc.navy.mil/stan/modules/stan/default.asp> .

ATTACHMENT A

1. To reduce motor maintenance and repair costs, the NAVY has implemented a program that allows for the use of Extended Life Double Seal (ELDS) bearings.

2. LIMITATIONS: The ELDS program does NOT apply to motors that are under the cognizance of NAVSEA 08.

3. APLs for motors meeting the conversion criteria requirements have been modified to identify ELDS bearings. In these cases, the APL bearing criteria will override any specifications delineated in the equipment technical manual or the motor "Original Equipment Manufacturer (OEM)" drawings. If ELDS bearings are not indicated in an APL, the following motor criteria must meet the applicability specifications for motors to undergo conversion to ELDS bearings:

3.a Motor must be installed on a surface ship and must NOT be under the cognizance of NAVSEA 08.

3.b Commercial motors are not eligible. Motors must have been furnished to the NAVY in accordance with MIL-DTL-17060 (Motors, Alternating Current, Integral Horsepower, Shipboard use), MIL-M-17413 (Motors, Direct Current, Integral H.P., Naval Shipboard [NAVY]) or MIL-M-17059 (Motors, 60 Cycle, Alternating Current Fractional H.P. [Shipboard Use]).

3.c Motors using one or more noise-quiet bearings per MIL-B-17931 (Bearings, Ball, Annular, For Quiet Operation) are NOT eligible for ELDS conversion.

3.d Bearings originally furnished with the motor must be Type 111 bearings per FF-B-171. Motors are NOT to be considered as candidates for ELDS conversion in situations where the equipment technical manual and/or the OEM motor drawings originally specified FF-B-171 bearings but have notes indicating that replacement bearings are to be in accordance with MIL-B-17931 (Bearings, Ball, Annular, For Quiet Operation).

3.e The use of ELDS bearings is limited to motors where the full load speed and the size of both bearings are as follows:

1. Maximum bearing size 306 or 206 and full load rpm between 1,801 and 3,600 rpm.

2. Maximum bearing size 313 or 213 and full load rpm between 1,201 and 1,800 rpm.

3. Maximum bearing size 318 or 218 and full load rpm less than 1200 rpm.

4. The repair process using ELDS bearings includes the following requirements:

4.a Only ELDS bearings, in accordance with the following table (Attachment A / Table 1), can be used. Other double seal bearings will not provide an acceptable bearing life.

Attachment A / Table 1

ELDS Bearings NSNs and Part Numbers

SIZE	P/N	NSN
201	6201-2RS1C3/GHY	3110-01-492-0221
202	6202-2RS1C3/GHY	3110-01-491-0233
203	6203-2RS1C3/GHY	3110-01-491-0234
204	6204-2RS1C3/GHY	3110-01-491-6636
205	6205-2RS1C3/GHY	3110-01-451-9166
206	6206-2RS1C3/GHY	3110-01-451-9165
207	6207-2RS1C3/GHY	3110-01-451-9164
208	6208-2RS1C3/GHY	3110-01-451-9170
209	6209-2RS1C3/GHY	3110-01-451-9252
210	6210-2RS1C3/GHY	3110-01-492-1831
211	6211-2RS1C3/GHY	3110-01-518-0937
303	6303-2RS1C3/GHY	3110-01-493-3750
304	6304-2RS1C3/GHY	3110-01-451-9153
305	6305-2RS1C3/GHY	3110-01-451-9158
306	6306-2RS1C3/GHY	3110-01-451-9159
607	6307-2RS1C3/GHY	3110-01-451-9161
308	6308-2RS1C3/GHY	3110-01-451-9167
309	6309-2RS1C3/GHY	3110-01-451-9168
310	6310-2RS1C3/GHY	3110-01-490-6683
311	6311-2RS1C3/GHY	3110-01-492-0223
312	6312-2RS1C3/GHY	3110-01-490-6848
313	6313-2RS1C3/GHY	3110-01-492-0191

314	6314-2RS1C3GHY	3110-01-492-0226
315	6315-2RS1C3/GHY	3110-01-494-0993
316	6316-2RS1C3/GHY	3110-01-492-0188
317	6317-2RS1C3/GHY	3110-01-492-0219
318	6318-2RS1C3/GHY	3110-01-493-3749

4.b Both bearings of each converted motor must be ELDS bearings.

4.c A label plate must be permanently attached to the motor indicating "Do Not Lubricate".

4.d Grease fills and drains, if present, must be fitted with a pipe plug, securely fastened. Fittings to accommodate grease guns must be replaced with pipe plugs."

ATTACHMENT B

SECTION 1. NAME PLATE DATA

EQUIPMENT _____ USS _____
 MFGR _____ TYPE _____ FRAME _____
 HP _____ INSULATION CLASS _____ TEMP. RISE _____ *C/*F _____
 VOLTS _____ AMPS _____ CYO _____ R/M _____
 PHASE _____
 SERIAL NO. _____ ADDITONAL DATA _____

SECTION 2. INPLACE INSPECTION

CAUTION: OBSERVE APLICABLE SAFETY PROCEDURES

SATISFACTORY
 UNSATISFACTORY

_____ INSULATION RESISTANCE IN MEGOHMS (REFER TO TABLE 3-2) _____

POLARIZATION INDEX TEST 1 MIN _____ 10 MIN _____ RATIO _____

_____ MECHANICAL CONDITION (REFER TO PARAGRAPH 3-6) _____
 _____ CONTINUITY OF WINDINGS (REFER TO PARAGRAPH 3-5.1) _____
 _____ CURRENT BALANCE (USE LIMITS PRESCRIBED IN PARAGRAPH 3-10) _____
 _____ CONDITION OF BRUSHED AND COMMUTATOR _____
 _____ CONDITION OF CABLES AND CONTROLLER TO MOTOR _____
 _____ CONDITION OF CONTROLLER _____

SECTION 3. INCOMING INSPECTION (GENERAL)

SURGE TEST	1-2	
	SAT/UNSAT	
	2-3	SAT/UNSAT
INSULATION RESISTANCE TO GROUND	1-3	SAT/UNSAT
		MEGOHMS
	1-2	OHMS
RESISTANCE BALANCE WITH DIGITAL OHMETER	2-3	OHMS
	1-3	OHMS

ACTION **REWIND**
RECONDITION

ATTACHMENT B

SECTION 4. RECONDITIONING

	AFTER STEPS OF:	
	CLEANING	DRYING
INSULATION RESISTANCE (MEGOHMS)	_____	_____
PHASE RESISTANCE BALANCE TEST	_____	_____
SURGE TEST (SAT/UNSAT)	_____	_____
DC HIGH-POTENTIAL TEST	_____	_____
 ACTION	REWIND	
VARNISH	_____	

SECTION 5. AFTER RECONDITIONAING OR REWINDING AND VARNISHING

		MEGOHMS		
INSULATION RESISTANCE		_____		
POLARIZATION INDEX TEST	1	10		RATIO
	MIN	MIN	_____	_____
RESISTANCE BALANCE WITH DIGITAL OHMMETER		1-2	_____	OHMS
		2-3	_____	OHMS
		1-3	_____	OHMS
SURGE TEST			_____	SAT/UNSAT
AC HIGH-POTENTIAL TEST			_____	SAT/UNSAT
INSULATION RESISTANCE AFTER AC HIGH-POTENTIAL TEST			_____	MEGOHMS
NO-LOAD TEST		PHASE		AMPERES
		A	_____	
		PHASE		AMPERES
		B	_____	
		PHASE		AMPERES
		C	_____	

ATTACHMENT C

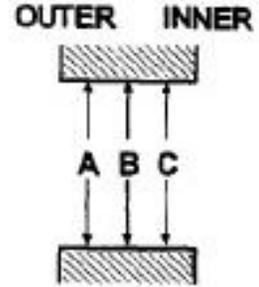
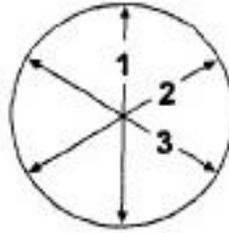
SHIPNAME & HULL NUMBER
MONTH/DAY/YEAR

DATE

MOTOR LOCATION (I.E., NO.2 MAIN FEED PUMP, ETC.)

HOUSING DIAMETERS

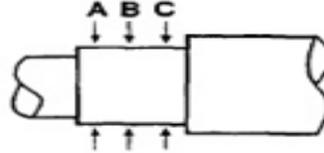
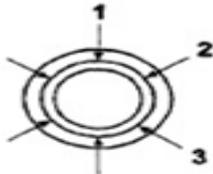
<u>DRIVE END</u>			
	A	B	C
1			
2			
3			



<u>OUTER END</u>			
	A	B	C
1			
2			
3			

SHAFT DIAMETERS*

	<u>DRIVE END</u>			<u>OUTER END</u>		
	A	B	C	A	B	C
1						
2						
3						



FOR BEARING JOURNAL WIDTH LESS THAN 1 INCH ONLY SIX READINGS ARE REQUIRED.

- A** SHAFT RADIAL RUNOUT _____
- B** FACE RUNOUT, BEARING INNER RING
DRIVE END _____
OUTER END _____
- C** FACE RUNOUT, BEARING OUTER RING
DRIVE END _____
OUTER END _____

MECHANICAL CONDITION
(LOSS OF LUBE, BURNED ETC.)

