

Bow Propulsion Unit Operational Test

OBJECTIVE

To demonstrate the proper operation of the Rudder Propeller, Training Motor and Hydraulic System for raising and lowering; to ascertain that the various components operate as a unit in accordance with the Manufacturer Technical Manual and Specifications.

REFERENCES

- (a) General Specifications of this availability
- (b) CG Tech Pub 3279, MANEUVERING SYSTEM, SWBS 568 VOL 1, 4/22/97

GENERAL REQUIREMENTS

- (1) Safety precautions shall be in accordance with Reference (a).
- (2) All test equipment used in this test will have a current calibration certification. Record description, model #, serial #, and date calibration is due on test equipment data sheet.
- (3) The temperature at the time of the test shall be recorded on the appropriate data sheet(s).

TEST EQUIPMENT

Voltmeter 500V
Amprobe 1000A
Megohmmeter 500V

METHOD

- 1. Insure adequate power is available to the Bow Propulsion Unit to support this test.
- 2. Measure and record the combined cold insulation resistance of the combined motors and controllers as listed on data sheet 2 Pg. 11 for the Training Motor, data sheet 1 Pg. 10 for the Hydraulic Pump Motor, and data sheet 3 Pg.-f;f for thg Drive Motor. Use Table I Pg. 9 and correct a-II readings to 25 deg C. The minimum readings shall not be less than 4 megohms.
- 3. Insure that all the controllers in the Bow Propulsion Room are OFF and the Local/Remote selector switch is in the Local position.
- 4. Deleted
- 5. Energize the Hydraulic Pump controller and place the Manual/Auto switch to the Auto position. Start the hydraulic pump by depressing the start button on the Machinery Room Console (MRC). Verify the hydraulic pump starts and automatically stops at 1800 + 15 PSI. Record the pressure the hydraulic pump stops on data sheet 1

METHOD (CONT'D)

"CAUTION" If the Drive Unit is UP, place the Drive Unit switch to Raise or if the Drive Unit is DOWN place the Drive Unit switch to Lower. This must be done prior to Raising or Lowering the Drive Unit to prevent possible damage to the positive lock cylinders and/or to prevent any sudden drop of the Drive Unit.

6. Insure the Drive Unit is properly aligned Fore and Aft and the Fore/ Aft indicator is illuminated on the MRC.
7. Raise and Lower the Drive Unit thru 2 complete cycles using the Raise/Lower switch on the MRC. During this operation check and record on data sheet 1 the following:
 - a. Smoothness and ease of operation
 - b. No unusual noise
 - c. No hydraulic leaks
 - d. Proper operation of the positive lock cylinders
 - e. Proper operation of the Unit UP and DOWN lights on the MRC
 - f. Hydraulic pump cycles on at approximately 1500 PSI
 - g. Motor voltage 450V + 5% (during any 1 cycle)
 - h. Motor current less than 14.1 Amps (during any 1 cycle)

Leave the Drive Unit in the DOWN position. Secure electrical power to all equipments, measure and record on data sheet 1 the hot insulation resistance of the hydraulic pump motor and controller. Use Table I and correct all readings to 25 C. The minimum readings shall not be less than 4 megohms.

8. Energize the Training motor controller and using the Training direction switch on the MRC, train the Drive Unit thru 2 complete revolutions (A1 Port & A2-to Stbd). During this operation check record on data sheet 2 the following:
 - a. Smoothness and ease of operation
 - b. No unusual noise
 - c. Angle indicator is in agreement with the actual position of the Drive Unit
 - d. Proper operation of the Fore/Aft light on the MRC
 - e. Motor voltage 450V \pm 5% (once during each direction of rotation)
 - f. Motor current less than 8 Amps (once during each direction of rotation)

METHOD (CONT'D)

8. (CONT-D)

Leave the Drive Unit in the DOWN position. Secure electrical power to all equipments, measure and record on data sheet 2 the hot insulation resistance of the Training motor and controller. Use Table I and correct all readings to 25 deg C. The minimum readings shall not be less than 4 megohms.

9. Test the System interlocks by the following methods:

Record "Satisfactory" on data sheet 4

- a. With the Drive Unit in the UP position verify the Main Drive motor cannot be started.
- b. With the Drive Unit in the UP position verify the Training motor cannot be started.
- c. With the Drive Unit in the DOWN position verify the unit will not raise until the unit Fore/Aft indicator is illuminated on the MRC.
- d. With the Drive Unit in the DOWN position and compartment ventilation secured, verify the Main Drive motor cannot be started.

NOTE:- Establish communications between the Pilothouse and the Bow Propulsion Room. (If the vessel is still in Drydock, communications must also be established with the dock). Insure all support systems are available for this test and that there is adequate clearance/water to lower, train, and run the Drive Unit. Insure the Drive selector switches on all consoles are on 0 (OFF).

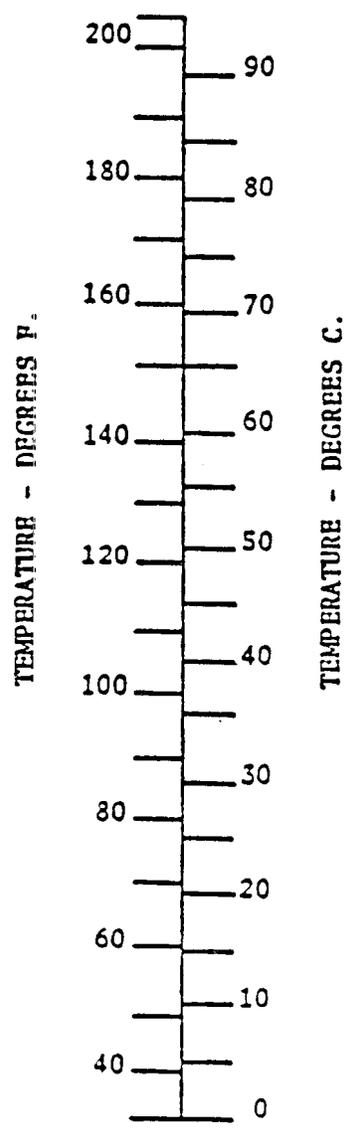
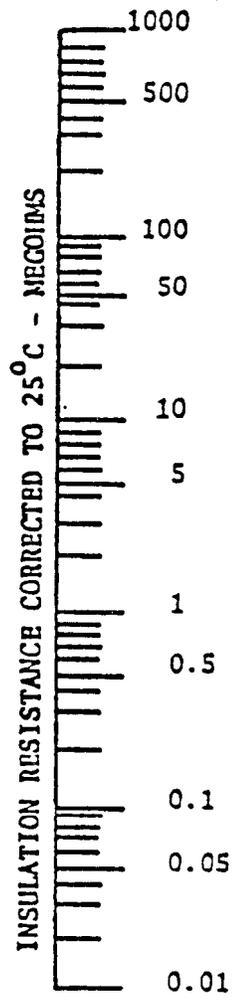
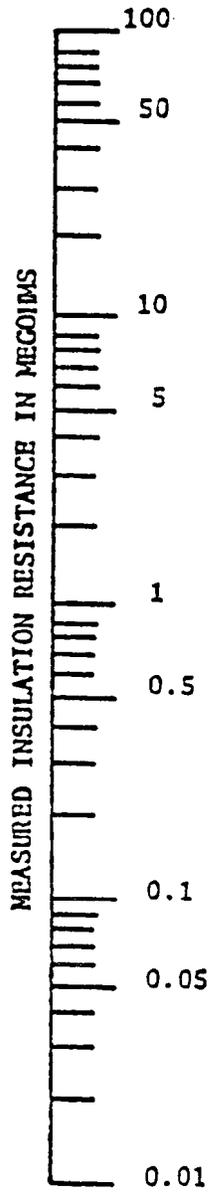
10. Insure the Main Drive control is in the 0 (OFF) position on the MRC. Energize the Drive motor controller and place the Drive control switch to position 1. Operate the unit for a minimum of 3 minutes. Check and record on data sheet 3 the following:

- a. Proper direction of propeller rotation
- b. No unusual noise
- c. No abnormal vibration
- d. No oil leaks
- e. Propeller RPM indicators agree
- f. Motor voltage $450 \pm 5\%$
- g. Motor current is less than 440 Amps

Repeat Step 10 for Main Drive control switch positions 2 thru 5.

METHOD (CONT'D)

11. Shift control from the MRC to the Pilothouse. Verify power ON lamp is illuminated on the Pilothouse and Port/Stbd Bridgewing consoles. Record on data sheet 4
12. Start the Hydraulic Pump by depressing the Hydraulic Pump Start button on the Pilothouse console. Verify pump starts. Record on data sheet 4
13. After pump automatically stops, lower the main drive unit and verify unit DOWN light illuminates when unit reaches the down position. Record on data sheet 4
14. Train the Main Drive Unit a minimum of one full rotation to Port and verify the angle indicator on the Pilothouse console agrees with the angle indicator on the MRC. Stop the unit in the Fore/Aft position and verify the unit Fore/Aft light illuminates. Record on data sheet 4
15. Using the Main Drive control operate the Main Drive Unit in position "1" and verify the RPM indicator on the Pilothouse console agrees with the RPM indicator on the MRC. Record on data sheet 4 Repeat Step 15 for Main Drive control positions 2 thru 5. Return the Main Drive control to the 0 position.
16. Shift control to the Port Bridgewing and repeat steps-14 & 15. Record on data sheet 4
17. Shift control to the Stbd Bridgewing and repeat steps 14 & 15. Record on data sheet 4
18. Shift control to the Pilothouse console. In the Bow Propulsion Room, simulate an overload condition in the Main Drive motor controller. Verify the motor "Overload Tripped" light illuminates on the Pilothouse console. Press the overload reset button and verify the "Overload Tripped" light extinguishes. Record on data sheet 4.
19. With the Unit Fore/Aft indicator illuminated, raise the Main Drive Unit and verify the unit "UP" light illuminates when unit reaches the up position. Record on data sheet 4
20. Stop the Hydraulic pump by depressing the Hydraulic Pump stop button on the Pilothouse console. Verify the pump stops. Record on data sheet 4.
21. Take control with the MRC and secure all equipment.



DIRECTIONS

SPOT THE MEASURED VALUE OF INSULATION RESISTANCE ON THE LEFT HAND SCALE, AND THE TEMPERATURE AT WHICH THE RESISTANCE WAS MEASURED ON THE RIGHT-HAND SCALE. PASS A STRAIGHT LINE THROUGH THESE TWO POINTS. THE POINT AT WHICH THE LINE CROSSES THE @MIDDLE SCALE INDICATES THE INSULATION RESISTANCE CORRECTED TO 25 DEGREES .CENTIGRADE.

DATA SHEET 1

STEP	HYDRAULIC PUMP SYSTEM	RESULTS			
2	Cold Insulation Resistance	MegOhm			
5	Pump Stops 1800 + 15 PSI	PSI			
7a	Smoothness & Ease of Operation				
7b	No Unusual Noise				
7c	No Hydraulic Leaks				
7d	Positive Lock Cylinders Operate				
7e	Unit Up & Down Lights. Operate				
7f	Pump Starts at 1500 + 15 PSI	PSI			
7g	Motor Voltage 450V + 5%.	AB	BC	CA	Up
		AB	BC	CA	Down
7h	Motor Current Less than 14.1 Amps	A0	B0	C0	Up
		A0	B0	C0	Down
7	Hot Insulation Resistance	MegOhm			

WITNESSES SIGNATURE'S	AMBIENT TEMP
CONTRACTOR	
COAST GUARD INSPECTOR	TEST DATE

DATA SHEET 2

STEP	TRAINING MOTOR SYSTEM	RESULTS			
2	Cold Insulation Resistance	MegOhm			
8a	Smoothness & Ease of Operation				
8b	No Unusual Noise				
8c	Angle Indicator Agrees with Drive Unit				
8d	Unit Fore & Aft Lights Operate				
8e	Motor Voltage 450 + 5%	AB	BC	CA	PORT
		AB	BC	CA	STBD
8f	Motor Current Less than 8 Amps	A0	B0	C0	PORT
		A0	B0	C0	STBD
	Hot Insulation Resistance	MegOhm			

WITNESSES SIGNATURE'S	AMBIENT TEMP
CONTRACTOR	
COAST GUARD INSPECTOR	TEST DATE

DATA SHEET 3

STEP	DRIVE MOTOR SYSTEM	RESULTS				
2	Cold Insulation Resistance	MegOhm				
		Position				
		1	2	3	4	5
9a	Propeller Rotation Correct					
9b	No Unusual Noise					
9c	No Abnormal Vibration					
9d	No Oil Leaks					
9e	RPM Indicator Agrees with Propeller					
9f	Motor Voltage 450 + 5%	AB				
		BC				
		CA				
9g	Motor Current Less than 440 Amps	A0				
		B0				
		C0				
9	Hot Insulation Resistance	MegOhm				
WITNESSES SIGNATURE'S		AMBIENT TEMP				
CONTRACTOR						
COAST GUARD INSPECTOR		TEST DATE				

STEP	INTERLOCKS	RESULTS		
10a	Drive Motor Fails to Start			
10b	Training Motor Fails to Start			
10c	Drive Motor will not Raise			
10d	Drive Motor Fails to Start			
STEP	PILOTHOUSE & BRIDGEWING CONTROLS	RESULTS		
		Pilot House	Port Bridge Wing	Stbd Bridge Wing
12	Power ON Lamp Illuminated			
13	Hydraulic Pump Starts			
14	Unit Down Light Illuminates			
15,17,18	RPM Indicators Agree	Pos 1		
		Pos 2		
		Pos 3		
		Pos 4		
		Pos 5		
19	Overload Tripped Indicator Illuminates			
	Overload Tripped Indicator Extinguishes			
20	Unit UP Light Illuminates			
21	Hydraulic Pump Stops			
WITNESSES SIGNATURE'S		AMBIENT TEMP		
CONTRACTOR				
COAST GUARD INSPECTOR		TEST DATE		

TEST-EQUIPMENT USED

<u>MANUFACTURER / MODEL</u>	<u>DESCRIPTION</u>	<u>SERIAL NO</u>	CALIBRATION <u>DUE DATE</u>
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COMMENTS: