

**United States Coast Guard
Surface Forces Logistics Command (SFLC)**

SFLC NAVAL ENGINEERING DIRECTIVE (SFLC NED) – 5890-01

**INSPECTION AND TEST PROCEDURE FOR DIESEL-HYDRAULIC
CRANE KB20-10-50 ON BOARD CGB 67 & 69**



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ABSTRACT

This directive covers the inspection and testing of the Diesel-Hydraulic Crane Model KB20-10-50 onboard CGB 67 and 69. The procedures listed here are based upon guidance of the United States Coast Guard Naval Engineering Manual, COMDTINST M9000.6E, manufacturers' recommendations and other noted references.

FEEDBACK & UPDATES

The latest version of this document is available at:

http://www.uscg.mil/SFLC/mlclant/vdiv/standard_specifications.asp

Beneficial comments, recommendations, additions, deletions and other pertinent data which may be of use to improve this document can be provided to the SFLC ESD.

REVISION RECORD

Revision Date	Summary Of Changes	INITIALS
2/24/05	Initial Release	JW
5/5/05	Deleted testing with 2-part rigging. Added fully extended slewing testing.	JW
5/6/2010	Converted entire document to SFLC format and style.	PWB

REFERENCES

The following references were used to develop and/or are cited in this document.

- A. Naval Engineering Manual (COMDTINST M9000.6E)
- B. Operation, Instruction and Maintenance Manual for Diesel-Hydraulic Crane KB20-10-50
- C. Surface Forces Logistics Center Standard Specification 5000 (SFLC Std Spec 5000), Jan 2009, Auxiliary Machine Systems

Personnel

The roles of operator, rigger, and inspector are designated as follows: the operator shall operate the system as specified, the rigger shall perform all necessary tasks to facilitate the specified operation, and the inspector shall perform all specified inspections and verifications. A repair facility may be required to fill one or more of these three roles, and shall perform each task assigned. The following bullet styles denote:

- An operation that shall be performed by the operator or a rigging task shall be performed by the rigger, as applicable.
- An inspection or verification that shall be performed by the by the inspector.

Required Test Weights

Jib Boom Lifting Eye Static Load Test Weight	- 15,000 (+750 -0) pounds
Hoist and Boom Static Load Test Weight	- 14,250 (+713 -0) pounds
Hoist and Boom Dynamic Load Test Weight -	11,870 (+594 -0) pounds
Hoist and Boom Rated Load Test Weight	- 9,500 (+0 -475) pounds
Full Outreach Slewing Rated Load Test Weight	- 3,000 (+150 -0) pounds

Part 1. Visual Inspection.

Visually inspect the following components for corrosion, wear, or damage and determine that the system is safe to handle weights.

1.1 Load-Bearing Machinery and Structure:

- Fall block and hook assemblies.
- Hoist wire rope assembly.
- Hoist sheave assemblies.
- Main hoist drums and winch assemblies.
- Boom structure.
- Turret structure.
- Luff hydraulic cylinders and their attachment points (pins, bushings, lock plates).
- Boom attachment points (pins, bushings, lock plates).
- Pedestal structure and turret-to-pedestal foundation bolts.

1.2 Electrical Safety Devices:

N/A

1.3 Hydraulic Components:

- Main hoist motors, brakes, and associated piping.
- Hose assemblies between the turret mounted valves and the boom.
- Hose assemblies between main hoist manifolds on the boom.
- Turret mounted directional control valves and manifolds.

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- Swing drive motors, brakes, and associated piping.
- Luff cylinder flow control valve.

1.4 Miscellaneous Electrical and Mechanical Components:

Control console in the crane shack.

All electrical cabling.

All electrical enclosures.

Part 2. No-Load Operational Test.

- Operate the main hoist, main boom, jib boom, and swing drives through their full ranges of motion.
- Verify all components listed below are in working order and further verify that the system is safe to handle weights:
 - Control Console
 - Luffing Cylinders
 - Articulating Boom Cylinder
 - Swing Drives and Turret
 - Hoist Assembly
 - Sheave Assemblies
 - Indicator Lights

Part 3. Jib Boom Lifting Eye Static Load Test

CAUTION

Do not attempt to operate the hoist, the boom, or the turret with the static load applied to the hoist hook.

- Rotate the boom to the centerline of the barge.
- Fully extend (i.e., raise) the main boom.
- Extend the jib boom so that the jib boom lifting eye is no further than 21 feet from the turret's axis of rotation (i.e., the centerline of the crane's turret).
- Suspend a test weight of 15,000 (+750 -0) pounds from jib boom lifting eye using a separate crane, a fork truck, or other external means.
- Leave the test weight on the lifting eye for 10 minutes.
- Remove the test weight from the jib boom lifting eye.
- Verify the jib boom lifting eye has no permanent deformation or damage.

Part 4. Hoist, Main Boom, Jib Boom, and Turret Weight Test.

4.1 Hoist and Boom Static Load Test

CAUTION

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Do not attempt to operate the hoist, the boom, or the turret with the static load applied to the hoist hook.

- Rotate the boom to the centerline of the barge.
- Extend (i.e., raise) the main boom to 75-80 degrees from horizontal and extend (i.e., raise) the jib boom to 43-47 degrees from horizontal (the hoist hook will be 20 (+0 -2) feet from the turret's axis of rotation).
- Suspend a test weight of 14,250 (+713 -0) pounds from the hoist hook using a separate crane, fork truck, or other external means.
- Leave the test weight on the hook for 10 minutes.
- Verify that the hoist brake does not slip.
- Verify the luff cylinders do not drift or leak.
- Remove the test weight from the hoist hook.
- Verify that the hoist drum, winch, and sheave attachment points (load-bearing fasteners and welds) are in good condition.
- Verify that the hoist wire rope, end fittings, and hook assembly are in good condition.
- Verify that there are no leaks from hydraulic hoses, tubing, or other components.

4.2 Hoist and Boom Dynamic Load Test

- Pick up a test weight of 11,870 (+594 -0) pounds using the hoist hook.
- Using the hoist only, raise and lower the test weight through 3 complete cycles, and through as large a hoisting range as practicable.
- Stop and hold the test weight for 30 seconds once in the up direction, then once in the down direction. Do this one time during each of the 3 cycles.
- Verify that the hoist brake stops and controls the test weight with no slippage or overheating.
- Verify that no unusual noise or vibration is emitted from the hoist assembly or sheaves.
- Starting from the main boom and jib boom angles specified above (para. 4.1), fully extend (i.e., raise) and then lower the booms back to the main boom and jib boom angles specified above, through 3 complete cycles.
- Stop and hold the test weight for 30 seconds once in the up direction, then once in the down direction. Do this one time during each of the 3 cycles.
- Verify that the luff and jib boom cylinders do not drift, leak, or bind during operation.
- Maintaining the main boom and jib boom angles specified above (para 4.1) rotate the turret fully counterclockwise and then fully clockwise through as large a range as practicable. Repeat 2 additional cycles.
- Stop rotating the turret once in the clockwise direction, then once in the counterclockwise. Do this one time during each of the 3 cycles.
- Verify the swing drive brakes stop and control the turret with no slippage or overheating.
- Verify that no unusual noise or vibration is emitted from the swing drives or the turntable bearing assembly.
- Remove the test weight from the hoist hook.
- Verify the hoist drum, winch, and sheave attachment points (load-bearing fasteners and welds) are in good condition.
- Verify that the hoist wire rope, end fittings, and hook assembly are in good condition.
- Verify that there are no leaks from hydraulic hoses, tubing, or other components.

4.3 Hoist and Boom Rated Load Test

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- Pick up a test weight of 9,500 (+0 -475) pounds using the hoist hook.
- Using the hoist only, raise and lower the test weight through 10 complete cycles, and through as large a hoisting range as practicable.
- Stop and hold the test weight for 30 seconds once in the up direction, then once in the down direction. Do this one time during 3 of the 10 cycles.
- Verify that the hoist brake stops and controls the test weight with no slippage or overheating.
- Verify that no unusual noise or vibration is emitted from the hoist assembly or sheaves.
- Starting from the main boom and jib boom angles specified above (para. 4.1), fully extend (i.e., raise) and then lower the booms back to the main boom and jib boom angles specified above, through 10 complete cycles.
- Stop and hold the test weight for 30 seconds once in the up direction, then once in the down direction. Do this one time during each of the 10 cycles.
- Verify that the luff and jib boom cylinders do not drift, leak, or bind during operation.
- Maintaining the main boom and jib boom angles specified above (para 4.1) rotate the turret fully counterclockwise and then fully clockwise through as large a range as practicable. Repeat 2 additional cycles.
- Stop rotating the turret once in the clockwise direction, then once in the counterclockwise direction. Do this one time during 3 of the 10 cycles.
- Verify the swing drive brakes stop and control the turret without no slippage or overheating.
- Verify that no unusual noise or vibration is emitted from the swing drives or the turntable bearing assembly.
- Remove the test weight from the hoist hook.
- Verify the hoist drum, winch, and sheave attachment points (load-bearing fasteners and welds) are in good condition.
- Verify that the hoist wire rope, end fittings, and hook assembly are in good condition.
- Verify that there are no leaks from hydraulic hoses, tubing, or other components.

4.4 Full outreach rated load slewing test.

- Pick up a test weight of 3,000 (+150 -0) pounds using the hoist hook.
- Fully lower and extend the boom as far as practicable.
- Rotate the turret fully counterclockwise and then fully clockwise through as large a range as practicable. Repeat 2 additional cycles.
- Stop rotating the turret once in the clockwise direction, then once in the counterclockwise. Do this one time during each of the 3 cycles.
- Verify the swing drive brakes stop and control the turret with no slippage or overheating.
- Verify that no unusual noise or vibration is emitted from the swing drives or the turntable bearing assembly.
- Remove the test weight from the hoist hook.
- Verify the hoist drum, winch, and sheave attachment points (load-bearing fasteners and welds) are in good condition.
- Verify that the hoist wire rope, end fittings, and hook assembly are in good condition.
- Verify that there are no leaks from hydraulic hoses, tubing, or other components.

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Part 5. Label plates and test reports.

- Document the satisfactory completion of the procedure by fabricating and installing a label plate and submitting a report as specified in MLCA Std Spec 5000_STD.