APPENDIX C - MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 AND 4 CRANES

Notes:

1. The following are the minimum inspection requirements. Due to the various makes and models of cranes in the Navy inventory with unique or special components, these specifications may require additional instructions. Components need not be disassembled for inspection, except: (a) where noted specifically to disassemble; (b) where activity experience warrants disassembly of specific components; or (c) where problems indicated by these inspections require disassembly for further inspection. Where disassembly and reassembly are required, or for other detailed inspection guidelines, TWDs, SROs, or other work documents shall be utilized (except for inspection covers) to properly document the necessary steps required for disassembly, reassembly, and/or other inspection guidelines. Deleting or reducing the frequency of these inspections requires Navy Crane Center approval (see paragraph 3.6 for deferral of maintenance inspections). Justification shall be provided with the activity's request. Additional or more frequent inspections based upon activity experience or OEM recommendations may be performed at the discretion of the activity. Additional inspection requirements and recommendations for specific OEMs are contained in CSAs and EDMs located on the Navy Crane Center web site (https:/[/www.navfac](http://www.navfac.navy.mil/ncc)).[navy.mil/ncc).](http://www.navfac.navy.mil/ncc))
2. These specifications include both non-operational and operational inspection criteria. Where necessary to ensure the safety of inspection and maintenance personnel, the crane shall be de-energized in accordance with approved lockout procedures.
3. For inspections that involve fluids (lubricants, coolants, brake fluid, hydraulic fluid, etc.) or grease, inspect the fluid or grease for visual appearance, smell, and feel, and inspect for indications of damaged or malfunctioning components.
4. Where an unsatisfactory condition is found, the item shall be identified on the "Unsatisfactory Items" sheet together with a statement of the condition observed. Corrective action in terms of adjustments, repairs, or replacements of items shall be detailed on a TWD, SRO, or other appropriate document. (See NAVFAC P-300 for a sample SRO.)
5. Brake data measurements shall be recorded on the "Brake Data" sheet. Measurement attributes and criteria shall be based on brake and/or crane OEM recommendations and/or recommendations of the activity engineering organization. In addition to minimum and maximum settings, a preferred setting may be specified where appropriate. Where measurements are inaccessible without disassembly, those measurements need only be taken when the brake is disassembled.
6. Where measurements are specified by the activity engineering organization, those measurements shall be recorded. Wire rope dimensional measurements shall be recorded.
7. As an alternative to the above dimensional measurements, gages may be used if supplied by the OEM or as approved by the activity engineering organization. If gages are used, the gage part number or drawing number shall be recorded on the MISR.
8. Where an inspection item applies to multiple components (e.g., main hoist, auxiliary hoist, whip hoist), each component shall be identified in the "system inspected" column.
9. These inspection criteria address most of the features and components on typical cranes. If a crane is equipped with features or components not specifically covered by these requirements, those features and components shall be inspected (where inspection is practical, as determined by the activity engineering organization and approved by the certifying official) for proper condition and operation, e.g., emergency dynamic braking, motor overspeed and over temperature sensors, travel and rotate limit switches, and micro drives.
10. Where “NA” is used to note that an inspection criterion does not apply due to a reason other than the component or feature is not on the crane, or other than the inspection is not required due to the type of inspection (e.g., a “B” inspection item during an “A” inspection), the reason for the “NA” shall be entered on the “Remarks” sheet.

For example, if an “NA” is entered in the electric magnetic brake system brake lining inspection criterion (item 27a below the dashed line) due to the crane having holding brakes and this not being the second “C” inspection, these facts shall be noted on the “Remarks” sheet.

1. Items marked with a lower case sigma (cr) after the item number may be inspected by a mechanic or electrician in lieu of an inspector.

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| **MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 AND 4 CRANES**  SHEET 1\_\_ OF | | | | | | | | | | | | | | | | | |
| Crane | | | | | Type | | | | OEM | | | | Capacity | | | | |
| Prior Inspection | | | | | | | Current Inspection | | | | Legend: Check under condition  S = Satisfactory C = Corrected (If deferred, leave blank  and identify on Unsatisfactory Items sheet.)  U = Unsatisfactory NA = Not Applicable | | | | | | |
| DATE/HOURS | | | TYPE | | | | DATE/HOURS | | | TYPE |
| Item No | Inspection Type | | | | | Items to be Inspected | | Maintenance Inspection Specification | | | | System Inspected | | Condition | | | |
| A | B | | C | | S | U | C | NA |
| 1 | X | X | | X | | Cooling System (Hoses, Thermostat, Pump, Radiator) | | Inspect hoses for cracks, clamps for evidence of looseness, and entire system for leaks. Inspect for proper coolant level, color, abnormal particles, and clarity. During operation, inspect for leaks and verify proper shutter operation. Inspect for proper engine coolant temperature. Listen for abnormal noise originating from the water pump and inspect for leaking seals. | | | |  | |  |  |  |  |
|  |  | X | | X | |  | | Inspect for proper coolant freeze protection. Inspect radiator fan for damage. | | | |  | |  |  |  |  |
| 2 | X | X | | X | | Lube Oil Lines and Lube Pressure | | Inspect for evidence of loose connections, leakage, or damage. During operation, inspect for leaks. Inspect gauge for proper lube oil pressure. | | | |  | |  |  |  |  |
| 3 cr | X | X | | X | | Fuel Lines and Fuel Pressure | | Inspect for evidence of loose connections, leakage, or damage. During operation, inspect for leaks. Verify proper operation of the fuel pump and fuel pressure gauge and inspect fuel pressure. | | | |  | |  |  |  |  |
| cr  4 |  |  | | X | | Starter | | Inspect for damaged or deteriorated wiring, evidence of loose connections, and proper lubrication. Operate starter and listen for abnormal noise and verify proper operation. | | | |  | |  |  |  |  |
| 5 cr |  | X | | X | | Air Starting Lines | | Inspect for evidence of loose connections and damage. When lines are charged, inspect for leaks. Inspect lubricators for lubrication level and leakage. | | | |  | |  |  |  |  |
| 6 cr |  | X | | X | | Drive Belts | | Inspect drive belts on fan, water pump, oil pumps, alternator, and external fuel transfer pumps for tension and wear. | | | |  | |  |  |  |  |
| 7 cr |  | X | | X | | Engine Alternator/ Generator (Battery Charging System) | | Inspect for cleanliness and proper lubrication Inspect external wiring for damage, deterioration, or oil or grease contamination, and for evidence of loose connections. During operation, inspect for rubbing, vibration, and sparking. Listen for abnormal noise. Verify that alternator/generator is properly charging batteries. | | | |  | |  |  |  |  |
| 8 cr |  | X | | X | | Battery and Cables | | Inspect battery for proper electrolyte level, cleanliness, structural distortion, damaged racks/holders, and evidence of loose terminals. Inspect battery cables for damage or deterioration, and for evidence of loose connections. | | | |  | |  |  |  |  |
| 9 cr |  | X | | X | | Voltage Regulator (Battery Charging System) | | Inspect for evidence of loose or damaged wires and connections. During operation, verify regulator cycles and does not overcharge batteries. | | | |  | |  |  |  |  |
| 10 cr |  | X | | X | | Engine Wiring | | Inspect wiring to lights, warning devices, and meter connections for damage or deterioration, and for evidence of loose connections. | | | |  | |  |  |  |  |

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| **MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 AND 4 CRANES**  SHEET 2\_\_ OF | | | | | | | | | | |
| Crane | | | | | | | | | | |
| Item No | Inspection Type | | | Items to be Inspected | Maintenance Inspection Specification | System Inspected | Condition | | | |
| A | B | C | S | U | C | NA |
| 11 cr |  | X | X | Gauges (Oil, Fuel, Temp, Ammeter, Tachometer, etc.) | Inspect for identification, legibility, and condition. Inspect for evidence of loose electrical or mechanical connections. Verify operation (calibration not required). |  |  |  |  |  |
| 12 |  | X | X | Turbocharger | Inspect for evidence of loose or missing mounting bolts and parts. During operation, inspect for vibration and oil leaks. Listen for abnormal noise. |  |  |  |  |  |
| 13 |  | X | X | Governor | Inspect linkage for evidence of binding, looseness, and damaged parts. Inspect for proper oil level. Verify proper operation. |  |  |  |  |  |
| 14 cr | X | X | X | Fuel Filters | Inspect for leaks prior to and during operation. |  |  |  |  |  |
| 15 cr | X | X | X | Air Cleaner | Inspect mounting brackets for evidence of loose or missing fasteners. Inspect for proper oil level and condition of filter element or vacuum indicator. |  |  |  |  |  |
| 16 cr |  | X | X | Throttle Linkage | Inspect for evidence of loose and damaged components. Verify proper operation. |  |  |  |  |  |
| 17 |  | X | X | Clutch-Main Drive | Inspect linkage for damage, for evidence of binding, loose and worn components, and for proper lubrication and adjustment. During operation, inspect for slippage and evidence of binding. Listen for abnormal noise. |  |  |  |  |  |
|  |  |  | X |  | At every second "C" inspection, disassemble and inspect all internal components. Note: This item applies to friction-type cranes; it does not apply to chassis drive clutches. |  |  |  |  |  |
| 18 cr |  | X | X | Exhaust System | Inspect for holes, for damaged gaskets, for evidence of loose or missing fasteners, and for proper insulation. During operation, inspect for leaks and sparks. Listen for abnormal noise. |  |  |  |  |  |
| 19 | X | X | X | Engine Condition | During operation, inspect for excessive smoking and vibration. Listen for abnormal noise. Follow main and or auxiliary engine OEM guidelines for specific additional inspection items. |  |  |  |  |  |
| 20 |  | X | X | Engine Alarm Safety Devices | Inspect wiring for damage or deterioration, and for evidence of loose connections. |  |  |  |  |  |
| 20a |  |  | X | Engine Alarm Safety Devices (not applicable to auxiliary or mobile crane engines) | Verify proper operation of engine overspeed, oil system, and water system shutdown and/or alarm systems by testing with sensors installed where practical. If sensor removal is necessary for shop testing or calibration, reinstallation and inspection shall be per controlled procedures approved by the activity engineering organization. |  |  |  |  |  |
| 21 |  |  | X | Heat Exchanger | Inspect for oil and water leaks, and for evidence of loose or missing fasteners. During operation, verify operation of temperature gauges. |  |  |  |  |  |
| 22 cr |  |  | X | Fuel Tank | Inspect fuel tank for leaks, for condition of gauge, and for evidence of loose or missing fasteners. Inspect fuel strainers and filters. Inspect for proper venting. Inspect for visible corrosion and evidence of corrosion below fuel level and debris in fuel. |  |  |  |  |  |
| 23 | X | X | X | Clutches (Boom, Hoist, Swing, and Travel) | Inspect clutch linkage for damage, for evidence of binding and loose or worn components, and for proper lubrication and adjustment. Inspect clutch linings for wear, de-bonding, and glazing, and drums for smoothness and for evidence of overheating. During operation, inspect for slippage and evidence of binding. Listen for abnormal noise. |  |  |  |  |  |

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| **MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 AND 4 CRANES**  SHEET 3\_\_ OF | | | | | | | | | | |
| Crane | | | | | | | | | | |
| Item No | Inspection Type | | | Items to be Inspected | Maintenance Inspection Specification | System Inspected | Condition | | | |
| A | B | C | S | U | C | NA |
| 24 | X | X | X | Mechanical Brakes | Inspect system for damage, for evidence of binding, loose, and worn components, and for proper lubrication. Inspect brake linings for wear, and drums for smoothness and for evidence of overheating. Inspect brakes for proper settings and for alignment of brake shoes. During operation, verify proper release, engagement, and stopping action in both directions of motion.  Inspect for evidence of overheating. |  |  |  |  |  |
|  |  | X | X | Brake Linings | Disassemble as required to inspect brake linings for wear, de-bonding, and glazing. For hoist brakes that stop the movement of the load under normal operation conditions, this shall be done annually. For other hoist brakes (i.e., holding brakes) and for rotate and travel brakes (including chassis travel brakes), disassemble as required at every second “C” inspection. |  |  |  |  |  |
| 25 a | X | X | X | Hydraulic Brake System (Shoe, Caliper/Disc, and Band Type Brakes) | Inspect system for damage, for evidence of binding, loose, and worn components, and for proper lubrication. Inspect brake linings for wear, and drums or rotors for smoothness, and for evidence of overheating. Inspect brakes for proper settings and for alignment of brake shoes, calipers, and bands. Inspect master cylinders for proper hydraulic brake fluid level. Inspect lines for damage or leakage, and for evidence of loose connections. During operation, verify proper release, engagement, and stopping action in both directions of motion. Inspect for evidence of overheating. (Not applicable to internal disc brakes on mobile and floating crane hoist and rotate assemblies.) |  |  |  |  |  |
|  |  | X | X | Brake Linings | Disassemble as required to inspect brake linings for wear, de-bonding, and glazing. For hoist brakes that stop the movement of the load under normal operation conditions, this shall be done annually. For other hoist brakes (i.e., holding brakes) and for rotate and travel brakes (including chassis travel brakes), disassemble as required at every second “C” inspection. (Not applicable to internal disc brakes on mobile and floating crane hoist and rotate assemblies.) |  |  |  |  |  |
| 25 b | X | X | X | Hydraulic Brake System (Caliper Brakes on Wire Rope Drums) | Inspect system for damage, for evidence of binding, loose, and worn components, and for proper lubrication. Inspect brake linings for wear, and braking surfaces for smoothness and for evidence of overheating. Inspect brakes for proper settings and for alignment of calipers. Inspect for proper hydraulic brake fluid level. Inspect system (pumps, accumulator, gauges, and lines) for damage or leakage, and for evidence of loose connections. During operation, verify proper release and engagement and stopping action in both directions of motion and timing of release and engagement. For brakes with Belleville torque springs, record the number of cycles as shown on the brake cycle counter. |  |  |  |  |  |

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| **MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 AND 4 CRANES**  SHEET 4\_\_ OF | | | | | | | | | | |
| Crane | | | | | | | | | | |
| Item No | Inspection Type | | | Items to be Inspected | Maintenance Inspection Specification | System Inspected | Condition | | | |
| A | B | C | S | U | C | NA |
| 25 b cont |  | X | X | Hydraulic Brake System (Caliper Brakes on Wire Rope Drums) | Compare the total number of cycles applied to each brake actuator's Belleville springs to the allowable maximum number of cycles specified for that actuator and ensure that none of the springs have exceeded the maximum value. Record Belleville spring cycle limit and number of cycles in the equipment history file. (For brakes without cycle counters, the activity shall conservatively estimate the brake usage and ensure that the springs are replaced before their fatigue life is reached.) |  |  |  |  |  |
| 25b cont |  | X | X | Brake Linings | Disassemble as required to inspect brake linings for wear, de-bonding, and glazing. For brakes that stop the movement of the load under normal operating conditions, disassembly, as required, shall be done annually. For other brakes (e. g., holding brakes), disassemble as required at every second “C” inspection. |  |  |  |  |  |
| 26 | X | X | X | Air Brake System | Inspect system for damage, for evidence of binding, loose, and worn components, and for proper lubrication. Inspect brake linings and discs for wear, and drums or rotors for smoothness and for evidence of overheating. Inspect brakes for proper settings, and for alignment of shoes, calipers, and bands. Inspect air lines for damage and evidence of loose connections. During operation, verify proper release, engagement, and stopping action in both directions of motion. Verify proper operation of the air application valves and inspect air application valves and air lines for leaks. |  |  |  |  |  |
|  |  | X | X | Brake Linings | Disassemble as required to inspect brake linings for wear, de-bonding, and glazing. For hoist brakes that stop the movement of the load under normal operation conditions, this shall be done annually. For other hoist brakes (i.e., holding brakes) and for rotate and travel brakes (including chassis travel brakes), disassemble as required at every second “C” inspection. |  |  |  |  |  |
| 27a | X | X | X | Electric Magnetic Brake System (Shoe Type Brakes including Thruster Brakes) | Inspect system for damage, evidence of binding, loose, worn components, and proper lubrication. Inspect brake linings for wear, and drums for smoothness and for evidence of overheating.  Inspect brakes for proper settings and for alignment of brake shoes. Inspect wiring for damage or deterioration, and for evidence of loose connections. During operation, inspect for proper release, engagement, and stopping action in both directions of motion and timing of release and engagement. Inspect for evidence of overheating or other evidence of incomplete brake release.  For thruster brakes, check hydraulic thruster actuator reservoir for fluid level and leakage. |  |  |  |  |  |
|  |  | X | X | Brake Linings | Disassemble as required to inspect brake linings for wear, de-bonding, and glazing. For hoist brakes that stop the movement of the load under normal operation conditions, this shall be done annually. For other hoist brakes (i.e., holding brakes) and for rotate and travel brakes, disassemble as required at every second “C” inspection. |  |  |  |  |  |

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| **MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 AND 4 CRANES**  SHEET 5\_\_ OF | | | | | | | | | | |
| Crane | | | | | | | | | | |
| Item No | Inspection Type | | | Items to be Inspected | Maintenance Inspection Specification | System Inspected | Condition | | | |
| A | B | C | S | U | C | NA |
| 27 b | X | X | X | Electric Magnetic Brake System (Disc Type Brakes) | Inspect brake housings for damage or evidence of loose hardware. Inspect brakes for proper settings. During operation, verify proper release, engagement, alignment of components, and stopping action in both directions of motion and timing of release and engagement. Inspect for vibration and overheating. Listen for abnormal noise. |  |  |  |  |  |
|  |  | X | X | Internal Brake Components | Disassemble as required to inspect brake linings for wear, debonding, alignment of components, or glazing or for damaged brake discs, splines, or other internal components. For hoist brakes that stop the movement of the load under normal operation conditions, this shall be done annually. For other hoist brakes (i.e., holding brakes) and for rotate and travel brakes, disassemble as required at every second “C” inspection. |  |  |  |  |  |
| 28 |  | X | X | Shafts and Couplings, including couplings integral to motor/speed reducer assemblies. | Inspect for damage, for leaking seals, and for evidence of loose keys, coupling bolts, and covers. During operation, inspect for vibration and other evidence of misalignment or damaged components. Listen for abnormal noise. Inspect for evidence of bearing damage, overheating, and abnormal wear. Inspect pillow blocks for damage, paying special attention to possible cracks in cast iron pillow blocks loaded in shear and tension, loose or missing fasteners, and cracks caused by overtensioned fasteners. |  |  |  |  |  |
|  |  |  | X | Boom, Hoist, and Single Rotate Drives | Verify coupling alignments are within OEM tolerances at every second "C" inspection (not applicable to NEMA c, d, and p-face motors). Coupling alignment verification data shall be filed in the equipment history file. |  |  |  |  |  |
| 29 a |  | X | X | Gearing (Boom, Hoist, Rotate, Travel) External Gears | Inspect for damaged or worn gears, for evidence of misalignment or loose keys or fasteners, and for proper lubrication. During operation, listen for abnormal noise, and inspect for other evidence of possible damage. Inspect pillow blocks for damage, paying special attention to possible cracks in cast iron pillow blocks loaded in shear and tension, loose or missing fasteners, and cracks caused by over-tensioned fasteners. |  |  |  |  |  |
| 29 b |  | X | X | Gearing (Boom, Hoist, Rotate, Travel) Internal Gears | Inspect for proper gear case lubricant level, leaks, and evidence of loose or missing mounting fasteners. Inspect breathers for restrictions. During operation, inspect for vibration, overheating, and other evidence of damaged internal components or misalignment. Listen for abnormal noise. Inspect for evidence of bearing damage, overheating, and abnormal wear. |  |  |  |  |  |
| 29 c |  | X | X | Internal Gears, Boom, Hoist, and Single Rotate Drives. (Not applicable to hydraulic mobile cranes.) | Monitor using an oil or vibration analysis program. The oil or vibration analysis shall be performed at least once each certification period with results analyzed by a qualified source. The results of the analysis shall be documented and retained in the equipment history file for the life of the component. |  |  |  |  |  |

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| **MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 AND 4 CRANES**  SHEET 6\_\_ OF | | | | | | | | | | |
| Crane: | | | | | | | | | | |
| Item No | Inspection Type | | | Items to be Inspected | Maintenance Inspection Specification | System Inspected | Condition | | | |
| A | B | C | S | U | C | NA |
| 29 c cont |  |  | X | Internal Gears, Boom, Hoist, and Single Rotate Drives- Alternate. (Not applicable to hydraulic mobile cranes.) | As an alternative to oil or vibration analysis, internal gears shall be visually inspected for wear or damage and for evidence of misalignment. If all gears cannot be visually inspected through inspection ports or by video probe or similar inspection devices, the gear cases shall be disassembled for visual inspection. If this alternative is selected, perform inspections at every third "C" inspection. Document the results in equipment history file. |  |  |  |  |  |
| 29 d |  | X | X | Hydraulic Mobile Crane Hoist and Rotate Drives (Also see Item # 35a) | Follow OEM service guidelines for disassembly, inspection, and replacement and/or repair of internal components such as gears, clutches, internal brake components, spline couplings, etc. Document OEM inspection/replacement interval and crane age in history files. Note: Use this item for Westmont floating crane (YD) hydraulic rotate drives and brakes. |  |  |  |  |  |
| 30 |  |  | X | Chains and Sprockets | Inspect chains for proper tension, lubrication, and for evidence of loose or worn links and pins.  Inspect sprockets for worn or damaged teeth, for evidence of loose shafts and keys, and for proper lubrication. During operation, listen for abnormal noise. |  |  |  |  |  |
| 31 | X | X | X | Pawls, Ratchets, and Rotate Locks | Inspect for evidence of loose, damaged, or worn components. Inspect operating system for evidence of worn keys, loose fasteners, and broken springs. Operate pawls and rotate locks and inspect for proper setting. Verify limit switch and indicator light operation. |  |  |  |  |  |
| 32 cr |  | X | X | Air Compressor | Inspect for cleanliness, for evidence of loose or missing mounting fasteners, for proper belt tension and wear, and for condition of filters. During operation, verify proper operation of unloader valve and pressure switch. Listen for abnormal noise and inspect for vibration. |  |  |  |  |  |
| 33 | X | X | X | Pressure Vessel Inspection Certificate | Verify that pressure vessel inspection certificate is properly posted and current. (See UFC 3-430-07 or appropriate document for test procedure). |  |  |  |  |  |
| 34 |  | X | X | Air Control System | Inspect valves, cylinders, lines, regulators, and gauges for damage or deterioration, and for evidence of loose or missing fasteners. During operation, inspect system for leaks, and verify proper operation of valves, regulators, and gauges. Inspect controllers for damaged or worn seals, boots and guards. |  |  |  |  |  |
| 35 |  | X | X | Hydraulic System | Inspect hydraulic system components, including but not limited to motors, pumps, valves, cylinders, swivels, axle lockout devices, coolers, lines, regulators, and gauges for damage or deterioration, and for evidence of loose or missing fasteners. Inspect reservoir for proper fluid level. During operation, inspect system for leaks, and verify proper operation of motors, brakes, pumps, valves, cylinders, area definition devices, axle lockouts, regulators, and gauges. Ensure manual valves are properly positioned. Inspect controllers for damaged or worn seals, boots and guards. |  |  |  |  |  |



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| **MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 AND 4 CRANES**  SHEET 7\_\_ OF | | | | | | | | | | |
| Crane | | | | | | | | | | |
| Item No | Inspection Type | | | Items to be Inspected | Maintenance Inspection Specification | System Inspected | Condition | | | |
| A | B | C | S | U | C | NA |
| 35a |  | X | X | Hoist Hydraulic Systems (including boom lift and telescoping functions) | Monitor using an oil analysis program. The oil analysis shall be performed at least once each certification period with results analyzed by a qualified source. The results of the analysis shall be documented and retained in the equipment history file for the life of the component. Ensure hydraulic system filters are changed in accordance with OEM requirements. |  |  |  |  |  |
| 36 |  |  | X | Wheels and Axles | Inspect wheels for uneven wear, flat spots, chips, flange wear, and cracks, for evidence of loose or missing fasteners and bearing caps, and for proper lubrication. For mobile crane wheels, perform inspections in accordance with OEM recommendations. During operation, inspect for excessive movement between components, improper tracking, overheating, and other evidence of component wear or bearing damage. Listen for abnormal noise. |  |  |  |  |  |
| 37 | X | X | X | Mobile Crane Chassis (Steering, and Suspension) | Inspect components for damage or deterioration, and for evidence of loose or missing fasteners and cracked welds. During operation, inspect for abnormal play and other evidence of component wear. Listen for abnormal noise. |  |  |  |  |  |
| 38 | X | X | X | Tires | Inspect for proper air pressure. Inspect for damage, deterioration, or worn treads, and for evidence of loose or missing wheel lugs. |  |  |  |  |  |
| 39 |  |  | X | Crawler System | Inspect crawler tracks for damaged or broken treads, missing or broken pins, for proper track adjustment, and for evidence of loose or missing fasteners. Inspect drive sprockets for broken teeth, worn idlers or rollers, damaged track adjusting screws, damaged or missing lubrication fittings, and for proper lubrication. During operation, inspect for abnormal play, overheating, and other evidence of bearing damage or component wear. Listen for abnormal noise. |  |  |  |  |  |
| 40 |  |  | X | Travel Trucks, Equalizers, Gudgeons, Gudgeon Pins, and Retainers | Inspect for damage or deterioration, for evidence of loose or missing fasteners and cracked welds, and for proper lubrication. Verify proper operation. |  |  |  |  |  |
| 41 | X | X | X | Outrigger Assemblies | Inspect for damage or deterioration, and for evidence of loose or missing fasteners. During operation, inspect system for leaks, and verify proper operation of cylinders. Ensure drain holes are clear. |  |  |  |  |  |
| 42 |  | X |  | Structure (Portal Base, Boom (except mobile crane boom), A- Frame, Tower, Stiff legs, Sills, Support Pins, Retainers, etc.) | Visually inspect structural components for damaged, distorted, or deteriorated members and for evidence of loose or missing fasteners and cracked welds. Inspect support pins for proper lubrication. For damaged booms, see section 6. Ensure drain holes are clear. This inspection does not include inaccessible areas such as voids and crawl spaces. |  |  |  |  |  |

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| **MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 AND 4 CRANES**  SHEET 8\_\_ OF | | | | | | | | | | |
| Crane | | | | | | | | | | |
| Item No | Inspection Type | | | Items to be Inspected | Maintenance Inspection Specification | System Inspected | Condition | | | |
| A | B | C | S | U | C | NA |
| 42  cont |  |  | X | Structure (Portal Base, Boom (except mobile crane boom), A- Frame, Tower, Stiff legs, Sills, Support Pins, Retainers, etc.) | Inspect structural components for damaged, distorted, or deteriorated members (remove wire rope buffer blocks every “C” inspection to ensure they are not hiding boom corrosion), and for evidence of loose or missing fasteners and cracked welds. Inspect support pins for proper lubrication. For damaged booms, see section 6. Ensure drain holes are clear. This inspection is in more detail and includes usually inaccessible areas such as voids and crawl spaces. |  |  |  |  |  |
| 43 |  | X | X | Mobile Crane Boom | Inspect boom structure for damaged, distorted, or deteriorated members (remove wire rope buffer blocks to ensure they are not hiding boom corrosion), and for evidence of loose or missing fasteners and cracked welds. Inspect support pins for proper lubrication. For damaged booms, see section 6. Ensure drain holes are clear. |  |  |  |  |  |
| 43a | X | X | X | Telescoping Boom | Verify smooth operation, and inspect for proper lubrication and evidence of abnormally worn or improperly adjusted wear pads. Ensure drain holes are clear. |  |  |  |  |  |
| 44 |  | X | X | Handrails, Walkways, Ladders, and Personnel Safety Guards | Inspect for damage or deterioration, and for evidence of loose or missing fasteners and cracked welds. |  |  |  |  |  |
| 45 |  |  | X | Counterweight | Inspect counterweight and counterweight support structure for damage or deterioration, and for evidence of loose or missing fasteners. For concrete counterweights, inspect for loose or missing concrete. |  |  |  |  |  |
| 46 |  |  | X | Rotate Path Assembly | Inspect spider assembly and roller path for damage or deterioration, and for evidence of loose or missing fasteners and cracked welds. Inspect rollers for uneven wear, flat spots, chips, flange wear, cracks, or deterioration, for evidence of loose or missing fasteners, and for proper lubrication.  During operation, verify free rotation of rollers and inspect for evidence of misalignment. |  |  |  |  |  |
| 47 |  |  | X | Center Pin Steadiment and Support Assembly. | Inspect for damaged or deteriorated components, and for evidence of loose or missing fasteners and cracked welds. Inspect for proper lubrication. |  |  |  |  |  |
| 48 |  | X | X | Center Collector Assembly (Electrical or Hydraulic) | Inspect for loose or bent supports. Inspect wiring for damage or deterioration, and for evidence of loose connections. Inspect for worn brushes and proper spring tension. Inspect slip rings for damage, deterioration, indications of excessive wear, streaking, arcing/overheating, and proper contact. During operation, verify brush to collector ring alignment. Inspect for loose hydraulic connections, defective tubing, and leaks. Inspect for signs of damaged or worn bearings and smooth/proper rotation. |  |  |  |  |  |

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| **MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 AND 4 CRANES**  SHEET 9\_\_ OF | | | | | | | | | | |
| Crane | | | | | | | | | | |
| Item No | Inspection Type | | | Items to be Inspected | Maintenance Inspection Specification | System Inspected | Condition | | | |
| A | B | C | S | U | C | NA |
| 49 | X | X | X | Slewing Ring Bearings | Lubricate bearing at every “A”, “B”, and “C” inspection unless OEM requires more frequent lubrication. Bearing should be rotated while it is lubricated and rotated 720 degrees as a minimum. Inspect expelled lubricant for evidence of metal flakes or metal or plastic particles. |  |  |  |  |  |
| 49a |  | X | X | Slewing Ring Bearings | Inspect fasteners for proper tightness. For portal and floating cranes, measure and record internal axial clearance (thrust direction) between bearing rollers (balls) and races. Refer to OEM's literature for method and acceptance/rejection criteria. For mobile cranes, follow OEM recommendations for bearing wear inspection. RCDRs on periodicity, method, or acceptance/rejection criteria will be evaluated if the requesting activity obtains input and concurrence from the crane and bearing OEM. (If tightness verifications or clearance/wear checks are performed by maintenance personnel, the inspector shall perform an in-process review on a sample basis.) During operation, listen for abnormal noise and inspect for vibration. |  |  |  |  |  |
| 49b |  |  | X | Slewing Ring Bearings | Inspect fasteners for proper tightness. For cranes that have had a minimum of three consecutive satisfactory fastener tightness inspections with a torque wrench, tensioner, ultrasonic tension measuring device, or other measuring device that measures tension, the fastener tightness inspection with a torque wrench, tensioner, or ultrasonic tension measuring device may be performed at every “C” inspection in lieu of every “B” inspection. A visual inspection of tightness shall still be performed at every “B” inspection. A satisfactory tightness inspection is defined as no more than one loose fastener in any ring of fasteners for mobile cranes, or no more than five loose fasteners in any ring of fasteners for portal and floating cranes. All loose fasteners detected using this option shall be reported to the Navy Crane Center, Code 03. Loose fasteners shall be identified by permanent fastener number/location on inner or outer ring. |  |  |  |  |  |

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| **MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 AND 4 CRANES**  SHEET\_\_10 OF \_ | | | | | | | | | | |
| Crane | | | | | | | | | | |
| Item No | Inspection Type | | | Items to be Inspected | Maintenance Inspection Specification | System Inspected | Condition | | | |
| A | B | C | S | U | C | NA |
| 50 |  |  | X | Wire Rope Drums, Followers, and Machinery Foundations | Inspect drums for distortion, cracks, worn grooves, and for evidence of loose or missing fasteners and cracked welds. Inspect wire rope followers for proper adjustment and alignment. Inspect bearings for evidence of damage,  overheating, or abnormal wear. Inspect machinery foundations for damaged or deteriorated components, and for evidence of loose or missing fasteners and cracked welds. During operation, verify that at least two complete wraps of wire rope remain on grooved drums (at least three complete wraps on ungrooved drums) in all operating conditions, including extremes of hook or boom positions. Listen for abnormal noise. Inspect for vibration, overheating, and other evidence of component wear, bearing damage, or misalignment. Inspect pillow blocks for damage, paying special attention to possible cracks in cast iron pillow blocks loaded in shear and tension, loose or missing fasteners, and cracks caused by overtensioned fasteners. |  |  |  |  |  |
| 51 |  | X | X | Sheaves, Equalizer Bar | Inspect for abnormally worn or corrugated grooves, flat spots, abnormal play, and broken or cracked flanges in sheaves. Inspect for evidence of loose or missing fasteners, keepers, and lubrication fittings. Gage the wire rope grooves of all sheaves. Pay particular attention to sections of equalizer sheaves and saddles in contact with wire rope and where corrosion may develop because of poor drainage; these sections of equalizer sheaves and saddles shall be exposed and examined during “C” inspections for boom hoists and “B” inspections for all other hoists. During operation, verify free movement of all sheaves.  Listen for abnormal noise. Inspect for abnormal play, overheating, and other evidence of component wear or bearing damage. For polymer (plastic) sheaves, inspect for proper adjustment of sheave bearings (using OEM bearing specifications), inspect sheaves for any signs of abnormal play or wobble, cracks, deformation of the sheave hub, web, or flange, or bearing working loose from the sheave hub. Inspect equalizer bar for damage or deteriorated components. Ensure free movement and that bar does not bottom out over the range of hoist/boom operation.  Note: Inspection of extend/retract sheaves internal to telescoping booms may be limited to inspection through boom inspection ports unless there is evidence of deterioration or damage requiring disassembly of boom for complete inspection or replacement. For cranes without inspection ports, this Note may be utilized if the extend/retract cables, sheaves, and cable end connections can be visually inspected from either end of the boom. |  |  |  |  |  |

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| **MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 AND 4 CRANES**  SHEET 11 OF \_ | | | | | | | | | | |
| Crane | | | | | | | | | | |
| Item No | Inspection Type | | | Items to be Inspected | Maintenance Inspection Specification | System Inspected | Condition | | | |
| A | B | C | S | U | C | NA |
| 52 |  | X | X | Wire Rope, Fastenings, and Terminal Hardware. See next page for wire rope rejection criteria. | Thoroughly inspect the entire length of running ropes and standing ropes. The depth and detail of the inspection shall be that necessary to ensure that the entire rope is acceptable with special attention paid to areas of expected wear or damage, areas not normally visible to the operator during operation or pre-use check, and rotation-resistant rope. During the inspection, pay the wire rope out as far as possible. For sections that cannot be spooled off the drum, visual inspection of the wire rope on the drum is sufficient. Where it is not possible to pay out to the lowest layer, the crane shall not be used for applications where the uninspected rope (i.e., covered layers) would be spooled off the drum under load. The first layer of wire rope shall be properly reinstalled on the drum to provide adequate support for the upper layers. Remove wire rope dressing from selected areas exposed to significant wear, exposure, and abuse. Diameter measurements shall be taken at several places over the length of the rope. Record minimum dimension measured in the “remarks” block. Pay particular attention to sections in contact with equalizer sheaves and saddles or where corrosion may develop because of poor drainage; these sections shall be exposed and examined during “C” inspections for boom hoists and “B” inspections for all other hoists. Inspect wear blocks to ensure rope is not contacting structure.  Lubricate areas after inspection.  Inspect for defects noted below and for proper lubrication. Inspect poured sockets, wedge sockets, swage fittings, eyes, swivels, trunnions, and fasteners for undue looseness, wear, cracks, corrosion, and other damage. A special area to inspect is the base (lug or bail) to shank transition area for swaged sockets. Undue looseness in poured sockets is defined as looseness or evidence of slippage of wires in the securing material, evidence of deterioration of the securing material, looseness of wire rope strands or wires adjacent to the socket or any looseness resulting from cracks or other defects in the basket. Evidence of looseness between the securing material and the basket resulting solely from seating of the material in the basket is acceptable. Drum end fittings need only be disconnected or disassembled when experience or visible indications deem it necessary.  Note: Inspection of extend/retract cables internal to telescoping booms may be limited to inspection through boom inspection ports in lieu of OEM required boom disassembly, unless there is evidence of deterioration or damage requiring disassembly of boom for complete inspection or replacement. For cranes without inspection ports, this Note may be utilized if the extend/retract cables, sheaves, and cable end connections can be visually inspected from either end of the boom. Additionally, perform measurement/adjustment to extend/retract cable tension/slack in accordance with OEM instructions. |  |  |  |  |  |

Wire Rope Rejection Criteria. Remove damaged portions (or replace entire length, if necessary) if any of the following are found:

1. Kinked, Birdcaged, Doglegged, or Crushed Sections. Kinked, birdcaged, doglegged, or crushed rope in straight runs where the core is missing or protrudes through or between strands, or where the rope does not fit properly in sheave or drum grooves. (This does not apply to runs around eyes, thimbles, or shackles.).
2. Flattened Sections. Flattened sections where the diameter across the flat is less than 5/6 of nominal diameter. (This does not apply to runs around eyes, thimbles, and shackles.)
3. Broken Wires
   1. Running Ropes. Six randomly distributed broken wires in one lay or three broken wires in one strand in one lay. For rotation-resistant wire rope, two in a length equal to six times the rope diameter or four in a length equal to 30 times the rope diameter. One outer wire broken at the point of contact with the core of the rope that has worked its way out of the rope structure and protrudes or loops out from the rope structure ("valley break"). For end connections, two broken wires within one lay length of the end connection.
   2. Standing, Guy, and Boom Pendant Ropes. Three broken wires in one lay length in sections beyond end connection or two broken wires within one lay length of the end connection.
4. Loss in Diameter. Reduction from nominal diameter of more than five percent.
5. High or Low Strand. High or low strand where the height or depth exceeds one-half the strand diameter.
6. Corrosion. Corrosion such that significant pitting occurs on the surfaces of outside wires and obvious signs of internal corrosion, such as magnetic debris coming from the valleys. Minor surface roughness on outside wires is acceptable provided no significant pitting occurs and the rope is not corroded internally. Significant pitting is defined as pitting that cannot be removed by abrasive removal of less than 1/3 of the original diameter of individual outside wires.
7. Heat Damage. Evidence of heat damage from any cause.
8. Wavy Rope. Wavy rope (where the longitudinal axis of the wire rope takes the shape of a helix instead of a line) when the diameter of the envelope of the wave is greater than 110 percent of the diameter of the nominal diameter of the wire rope (133 percent in straight sections where the rope does not pass over sheaves or the drum). Use ISO 4309 as a guide.
9. Accumulation of Defects. An accumulation of defects that in the judgment of the inspector creates an unsafe condition.
10. Splices. Wire rope shall not contain splices.

Note: For those sections of wire rope with high strands, wavy, or flattened rope, consideration should be given to increasing the inspection periodicity due to the possibility of increased wear and reeving/spooling issues.

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| **MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 AND 4 CRANES**  SHEET\_\_12 OF \_ | | | | | | | | | | |
| Crane | | | | | | | | | | |
| Item No | Inspection Type | | | Items to be Inspected | Maintenance Inspection Specification | System Inspected | Condition | | | |
| A | B | C | S | U | C | NA |
| 53 | X | X | X | Hoist Blocks and Hooks | Inspect hoist blocks, cheek plates, swivels, trunnions, and lubrication fittings for damage or deterioration, cleanliness, freedom of movement, and for evidence of loose or missing fasteners. Inspect for loose, damaged, missing, or improperly sized retaining rings. Inspect hooks and mousing devices for damage. Inspect drip pans and gaskets for damage, proper clearance, and for evidence of loose or missing fasteners. Inspect for evidence of bearing damage, overheating, and abnormal wear. See appendix E for further inspections and tests. |  |  |  |  |  |
| 54 | X | X | X | Insulated Link | Inspect link surface for conductive contaminants such as graphite, grease, metallic particles, or rust streaks. Inspect for damage. See appendix E for further inspections and tests. |  |  |  |  |  |
| 55 cr |  | X | X | Machinery House and Operator's Cab | Inspect for leaks, broken glass, deterioration, and cleanliness. Verify proper operation of louvers, doors, windows, windshield wipers, heaters (particularly combustion heaters), air conditioners, operator's chair, and communication equipment. |  |  |  |  |  |
| 56 |  | X | X | Load Warning Devices, Load Shutdown Devices | Inspect wiring for damage or deterioration, and for evidence of loose connections. These devices shall be tested for proper operation at this inspection or the CCIR/load test (mark N/A and explain in Remarks if performed at the CCIR/load test). Use SAE J-159 as a guide for calibration checks for (testing and tolerance) of category 1 and 4 mobile cranes. For other cranes, if not specified by device OEM, the preferred accuracy requirement for all devices is to warn or shutdown at the set point minus 10 percent of the actual weight at the set point. Do not test beyond 125 percent of rated capacity (105 percent for mobile cranes, mobile boat hoists, and rubber-tired gantry cranes). If SAE guidelines or preferred accuracy requirement cannot be met, the minimum accuracy requirement is to warn or shutdown at the set point plus 5 percent minus 10 percent of the actual weight at the set point. Testing shall ensure the overload warning or shutdown works properly to warn or prevent an overload and does not engage at a nuisance low level. Testing values will depend on test weight availability and is not required to prove exact tolerances specified above. |  |  |  |  |  |
| 56a |  | X | X | Load Indicators | Inspect wiring for damage or deterioration, and for evidence of loose connections. These devices shall be tested for proper operation at this inspection or the CCIR/load test (mark N/A and explain in Remarks if performed at the CCIR/load test). Use SAE J-159 as a guide for calibration checks for (testing and tolerance) of category 1 and 4 mobile cranes. For other cranes, if not specified by device OEM, the preferred accuracy requirement for all devices is plus 10 percent minus 0 percent of the actual weight. Do not test beyond 125 percent of rated capacity (100 percent for mobile cranes, mobile boat hoists, and rubber- tired gantry cranes). If SAE guidelines or preferred accuracy requirement cannot be met, the minimum accuracy requirement is plus 10 percent minus 5 percent of the actual weight. |  |  |  |  |  |

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| **MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 AND 4 CRANES**  SHEET 13 OF \_ | | | | | | | | | | |
| Crane | | | | | | | | | | |
| Item No | Inspection Type | | | Items to be Inspected | Maintenance Inspection Specification | System Inspected | Condition | | | |
| A | B | C | S | U | C | NA |
| 57 cr |  | X | X | Drum Rotation Indicators | Inspect wiring for damage or deterioration, and for evidence of loose connections. Verify proper operation. |  |  |  |  |  |
| 58 |  | X | X | Radius/Boom Angle Indicator | Verify radius indications by comparing against measured radii at the minimum and maximum boom operating positions. Verify boom angle indications by comparing the indicated boom angle to the boom angle on the load chart corresponding to the boom length and measured radius. This test shall be accomplished at the minimum and maximum boom operating positions. This may be performed during the CCIR/load test in lieu of this inspection (mark N/A and explain in Remarks if performed at the CCIR/load test). Use SAE J-159 as a guide for calibration checks (testing and tolerance) of applicable systems. For other cranes, if not specified by the crane of radius indicator/boom angle indicator OEM, the preferred accuracy requirements are plus 10 percent minus 0 percent of the actual radius (or equivalent boom angle). For all indicators, if the SAE guidelines or preferred accuracy requirements cannot be met, the minimum accuracy requirements are plus 10 percent minus 3 percent of the actual radius (or equivalent boom angle). |  |  |  |  |  |
| 59 | X | X | X | Capacity Signs and Load Ratings | Inspect capacity signs and brackets for damage or deterioration, and for evidence of loose or missing fasteners. Verify that load ratings are correct, are noted in pounds, and are visible or otherwise available to the operator and riggers. |  |  |  |  |  |
| 60 cr | X | X | X | Fire Extinguishers | Verify inspection is current. |  |  |  |  |  |
| 61 |  | X | X | Controllers | Inspect for broken or loose springs, cracked or loose operating levers, and pitted or burned contact points and segments. Inspect for broken segment dividers and insulators, for excessive arcing, for evidence of worn or loose cams, pins, rollers, or chains, and for evidence of loose connections. Inspect for proper contact pressure. Inspect wiring for damage or deterioration, and for evidence of loose connections. Inspect for identifying label plates and indicators, and that crane and controller horizontal direction indicators match. Inspect such parts as bearings, star wheels, and pawls for proper lubrication. Inspect for proper spring return and neutral latching.  Inspect for damaged or worn seals, boots and guards. During operation, verify proper sequencing of speed points and operation of controller indicating lights and deadman switches. For cranes that utilize secondary or backup controllers, all controllers shall be operationally tested during either this inspection or the CCIR/test. If performed at the CCIR/test, note this in Remarks. |  |  |  |  |  |

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| **MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 AND 4 CRANES**  SHEET 14\_ OF | | | | | | | | | | |
| Crane | | | | | | | | | | |
| Item No | Inspection Type | | | Items to be Inspected | Maintenance Inspection Specification | System Inspected | Condition | | | |
| A | B | C | S | U | C | NA |
| 62 |  | X | X | Control Panels, Relays, Coils, Transfer and Disconnect Switches, Conductors and Electronic (Solid State) Drive Control Systems | Inspect (without removing) contacts for proper alignment, pitting, and evidence of excess heating and arcing. Inspect transfer and disconnect switches, conductors, coils and contact leads, and shunts for insulation breakdown, missing hardware, and evidence of overheating. Inspect wiring for damage, deterioration, and evidence of loose connections. Inspect fuses for proper ratings and type (see note 1 regarding disassembly), and for evidence of loose connections and overheating. Inspect overload devices for evidence of loose connections and overheating. Inspect circuit breakers and switches for cleanliness, loose broken worn or missing parts, and proper operation. Inspect panel boards and arc shields for cracks, evidence of loose or missing fasteners, cleanliness, and moisture. Manually operate relays, switches, contactors, and interlocks and verify that all moving parts operate freely without binding or excessive play. Inspect enclosures for cleanliness or damage, and for evidence of loose or missing fasteners and gaskets. During operation, verify proper operation of panel indicating lights and contactor sequence. Verify proper operation of environmental controls (e.g., strip heaters, cooling fans).  Inspect the electronic (solid state) drive control systems wiring for damage or deterioration, and for evidence of loose connections. Visually inspect (without removing) components for evidence of damage or overheating. Verify that the drive is dry and free of dust, dirt, and debris. If applicable/possible, inspect condition of or replace drive backup batteries. |  |  |  |  |  |
|  |  |  | X |  | Verify that the switch mechanism and/or handle on disconnects and safety switches cannot be moved to the energized or on position when locked in the de-energized or off position and that the handle properly indicates whether the switch is energized or de-energized. |  |  |  |  |  |
| 63 |  | X | X | Resistors | Inspect resistors, insulators, and brackets for damage, distortion, deterioration, and for evidence of loose or missing fasteners or overheating.  Inspect wiring for damage or deterioration, and for evidence of loose connections. |  |  |  |  |  |

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| **MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 AND 4 CRANES**  SHEET 15\_ OF | | | | | | | | | | |
| Crane | | | | | | | | | | |
| Item No | Inspection Type | | | Items to be Inspected | Maintenance Inspection Specification | System Inspected | Condition | | | |
| A | B | C | S | U | C | NA |
| 64 |  | X | X | Limit and Bypass Switches | Remove covers and inspect electrical and mechanical components and wiring for damage or deterioration, and for evidence of loose connections. Inspect enclosures for evidence of moisture and arcing. Inspect drive and actuating components for damage or deterioration, for proper lubrication, and for evidence of loose or missing fasteners. During operation, verify proper functioning of primary and secondary limit switches, indicator lights, settings, and bypass switches. Ensure proper functioning and setting of secondary hoist limit switches by using block (or boom) to engage limit switch and ensure block or boom does not two-block. This shall be performed and documented at least once during the life of the crane (or limit switch) and re- performed if the setting is affected or changed. Before performing, ensure switch is functioning properly electrically and station watch-stander to prevent damage. Check electrical function annually by using hand or other means to activate the switch. Check electrical function annually at this inspection, CCIR, or Appendix E no-load test by using hand or other means to activate the switch. If proper operation of secondary upper limit switch and/or lower limit switch is performed at the CCIR or Appendix E no- load test, note this in Remarks. |  |  |  |  |  |
| 65 | X | X | X | Warning Devices, Operational Aids, General Safety Devices (Horns, Bells, Lights, Reflectors, etc.), Wind Seed Indicators | Inspect components and associated wiring for damage or deterioration, and for evidence of loose connections. The activity engineering organization may reduce the frequency of opening enclosures based on their exposure to weather and past findings. The reduced frequency shall be no less frequent than every sixth annual inspection.  During operation, verify proper functioning of devices. Verify proper functioning of wind speed indicator. |  |  |  |  |  |
| 66 cr |  | X | X | Electrical Hardware and General Lighting | Inspect conduits, raceways, junction boxes, light fixtures, and associated wiring for damage or deterioration, and for evidence of loose connections. Verify operation of lights. The activity engineering organization may reduce the frequency of opening enclosures based on their exposure to weather or based on past findings. The reduced frequency shall be no less frequent than a “C” frequency. |  |  |  |  |  |
| 67 |  | X | X | Electrical Cable Reels | Inspect wiring for damage or deterioration, and for evidence of loose connections. Inspect reel assembly for damage, deterioration, and evidence of loose or missing fasteners. Inspect slip rings for damage, deterioration, indications of excessive wear, streaking, arcing/overheating, and proper contact. Verify proper operation. |  |  |  |  |  |

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| **MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 AND 4 CRANES**  SHEET\_\_16\_ OF | | | | | | | | | | |
| Crane | | | | | | | | | | |
| Item No | Inspection Type | | | Items to be Inspected | Maintenance Inspection Specification | System Inspected | Condition | | | |
| A | B | C | S | U | C | NA |
| 68 |  | X | X | Main and Auxiliary Generators. | Inspect generators and associated wiring for cleanliness, damage, deterioration, and evidence of loose connections. Inspect for proper lubrication. Inspect slip rings for damage, deterioration, indications of excessive wear, streaking, arcing/overheating, and proper contact. Inspect commutators for evidence of destructive commutation. Inspect brushes for proper brush tension and length, and for damage and deterioration. Inspect insulation for deterioration and evidence of overheating.  Inspect drive belts or coupling for damage deterioration and evidence of misalignment and loose or missing fasteners. During operation, inspect for vibration, overheating, or other evidence of misaligned, worn, or damaged internal components or bearings. Listen for abnormal noise. Verify proper voltage output. Verify proper operation of environmental devices (e.g., strip heaters, cooling fans). |  |  |  |  |  |
| 69 |  | X | X | Electric Motors (Boom, Hoist, Rotate, Travel) | Inspect motors (including accessible internal areas such as commutators and brushes) and associated wiring for cleanliness, damage, deterioration, and evidence of loose connections. Inspect for proper lubrication.  Inspect slip rings for damage, deterioration, indications of excessive wear, streaking, arcing/overheating, and proper contact. Inspect commutators for evidence of destructive commutation. Inspect brushes for proper brush tension and length, and for damage and deterioration. Inspect insulation, for deterioration and evidence of overheating.  During operation, inspect for vibration, overheating, other evidence of misaligned, worn, or damaged internal components or bearings. Listen for abnormal noise. Verify proper operation of environmental devices, (e.g., strip hearers, cooling fans).  Portal crane travel motors may be inspected at the following intervals: 25 percent at each “B” inspection, with the remaining 50 percent at the “C” inspection, unless issues are found at the “B” inspection that indicate that all motors should be inspected during the “B” inspection. |  |  |  |  |  |
| 70 | X | X | X | Operation of Crane Controls | Verify proper operation of all hoist, rotate, and travel functions, primary and secondary limit switches, bypass switches, indicator lights, level indicators, and settings. See Item 64 for additional instructions during “B” and “C” maintenance inspections. |  |  |  |  |  |
| 71 |  | X | X | Barge Compartments | Inspect compartments (voids) for standing water. |  |  |  |  |  |

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| **MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 AND 4 CRANES**  SHEET\_\_17\_ OF | | | | | | | | | | |
| Crane | | | | | | | | | | |
| Item No | Inspection Type | | | Items to be Inspected | Maintenance Inspection Specification | System Inspected | Condition | | | |
| A | B | C | S | U | C | NA |
| 72 |  | X | X | Crane Davits | Inspect davit structure for proper operation and any signs of damage. Check davit rope for cuts, abnormal wear, heat damage, or discoloration. Check tackle for free movement and operation. Check hook and tackle attachments for signs of damage and corrosion. |  |  |  |  |  |
| 73 |  | X | X | Lubrication and Servicing Records | Perform a review of lubrication and servicing records since the last maintenance inspection to ensure the lubrication and servicing were performed as specified. |  |  |  |  |  |
| 74 |  | X | X | OEM provided warning labels | Ensure OEM-supplied warning labels and decals are present and legible. |  |  |  |  |  |
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| **REMARKS:** | | | | | | | | | | |
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| **MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 AND 4 CRANES UNSATISFACTORY ITEMS** SHEET OF | | | | | | |
| Crane | | | | | | |
| NOTE: DESCRIBE ITEMS FOUND UNSATISFACTORY AND LIST SRO NUMBER ISSUED FOR CORRECTIVE ACTION. SIGN AND DATE TO VERIFY THAT THE DEFICIENCY HAS BEEN CORRECTED OR ACCEPTED AS IS. IDENTIFY DEFERRED ITEMS BY ANNOTATING A “D” IN THE SRO BLOCK. (SEE SECTION 3 FOR REQUIREMENTS FOR DEFERRAL OF WORK.) | | | | | | |
| Item No. | Deficiency | | | SRO No. | Verification of Correction (Signature and Date) | |
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| Mechanical Inspector (Signature): | | Date: | Electrical Inspector (Signature): | | | Date: |
| Mechanical Inspector (Signature): | | Date: | Electrical Inspector (Signature): | | | Date: |
| Mechanic (Signature): | | Date: | Electrician (Signature): | | | Date: |

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| MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 AND 4 CRANES  BRAKE DATA SHEET OF | | | | | | | | | | | |
| CRANE: | | | | | | | | | | | |
| NOTE TO INSPECTOR: Fill in applicable data as recommended by the brake and/or crane OEM. Record actual measurement inspected in ”INSP” block. If adjustments are made, record adjusted setting in “ADJ” block. Otherwise indicate “NA”. List repair document number and corrective action required under remarks. | | | | | | | | | | | |
| BRAKE | TYPE | SPRING LENGTH/ TORQUE SETTING | | | | AIR GAP/ PLUNGER STROKE | | | | LINING THICKNESS | |
|  | | MIN | MAX | ACTUAL | | MIN | MAX | ACTUAL | | MIN | ACT |
| INSP | ADJ | INSP | ADJ |
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| MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 AND 4 CRANES  BRAKE DATA SHEET OF |
| REMARKS: |
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