

**MANDATORY INSPECTION & MAINTENANCE**  
**OF**  
**HYDROMECHANICAL EQUIPMENTS**  
**BEFORE OPERATION**

**MANDATORY INSPECTION & MAINTENANCE**  
**BEFORE OPERATION OF GATES & ROPE DRUM HOISTS &**  
**GANTRY CRANES**

**A) VERTICAL LIFT GATES**

1. The Wheels shall be rotated by hand to check their free movement.
2. The wheel bearings and guide rollers shall be lubricated.
3. The seal shall be checked for damages, if needed, shall be replaced.
4. All nuts and bolts of Pulley brackets, Wheel assemblies, Guide shoes/rollers, Rubber seals shall be tightened.
5. The guide-assemblies, wheel-assemblies and sealing-assemblies shall be cleared off grit, sand or any other foreign material.
6. The wire rope shall be checked for equal tension. If broken strands are noticed (more than 10%), the wire ropes shall be replaced.
7. The wire ropes shall be lubricated if found dry with Cadium compound or manufacturer's recommended Lubricant.
8. The drain holes on the horizontal girders should be cleaned to ensure no water accumulates on the girders.

**B) RADIAL GATES**

1. The Trunnions shall be greased by using pressurised grease gun so that old grease comes out through the sides of trunnion pins. The trunnions should be cleaned of any debris between trunnion hub & bracket. Remove all dirt, grit etc. from trunnion assembly.
2. All the guide roller bushes shall be greased. The guide rollers should be free so that the same can be rotated by hand. The gap between wall plates & the guide rollers shall be checked and if required the guide rollers should be adjusted. The foundation bolts shall be checked for proper tightness.
3. The hoisting pulleys in case of D/S side hoisting arrangement should be lubricated.
4. The wire rope tension should be checked & adjusted if required.
5. All the drain holes on the horizontal girders & end arms should be cleared of debris.
6. All the nuts and bolts of Trunnion block assembly and its anchorages shall be checked for tightness.
7. It should be ensured that no foreign material or dirt/grit lies between skin plate & wall plates.

**C) ELECTRIC OPERATED ROPE DRUM HOISTS**

1. The rope drum covers should be opened.
2. Inspection should be made to ensure that no foreign material lies between gears & pinions.

- 3.The bolts connecting drum gear & drum flange should be checked for tightness. The wire rope clamps should be checked for tightness.
- 4.The drum gears & pinions should be lubricated with recommended lubricants if found dry.
5. The turn buckles should be checked for no. of threads contact with the nut. If required the turn buckles should be adjusted to ensure all the threads of the nut are engaged. It should be ensured that there is no cracks on the turn buckle or on the threads.
- 6.The lifting pulley bracket bushes, rope drum bushes,1<sup>st</sup> shaft,2<sup>nd</sup> shaft & line shaft bearings should be lubricated by pressurized grease gun so that old greases comes out.
- 7.The worm reducers should be checked for proper level of the gear oil. The gear oil must be maintained between min. & max. level.
8. The breather caps should be cleaned to enable the entrapped & generated gases to exit the worm reducer.
- 9.The Electro Magnetic brakes should be properly adjusted for effective braking &release. The worn out brake shoes should be replaced. The brake liners should be cleaned to remove oil/grease.
- 10.The limit switches should be checked for proper functioning to arrest over travel of the gates.
- 11.All the foundation bolts of the Worm Reducer, E.M.Brake & Motor should be checked for proper tightness.
12. Check the insulation resistance of the motor between any terminal and the frame which should not be less than (1000+rated H.P.) megohms. If the measured resistance is less than this value, then steps shall be taken to dry-out the motors either by passing a low voltage current through the windings or by placing the stator and rotor only in a warm dry place for a day or so.
- 13.Check resistance or earth connections.
- 14.Examine all connections to see that no wires are broken and no connections are loose.
15. If the contactor hums, the magnet faces should be cleaned. (Blackening of contacts caused by deposition of silver due to arching is of no importance).
16. The contact tips should be kept free from burns or pits by smoothening with fine sand paper or emery paper.
17. Replace the contact tips if 50% of the contact point has worn out.
18. The overload relays should be set at the rated current of the motor as per manufacturers manual to prevent the motor to achieve pullout torque.

**NB:-IT SHOULD BE ENSURED THAT SUPPLY VOLTAGE AT MOTOR POINT SHALL BE 3Ø, 415V ±10 %,50HZ±3%.IN CASE THE SUPPLY VOLTAGE IS LESS THAN 400V,THE POWER SUPPLY SHALL BE MADE THROUGH STANDBY DG SETS.**

## **D) GANTRY CRANES TO OPERATE STOPLOGS**

1. Lubrication of each part of crane i.e. Crane wheel bushes, Rope drum bushes, all plunger block bearings, Line shaft bearings, main pulleys, balancing pulleys. Lifting beam pulleys/Turn buckles nuts/threads, Lifting hook bushes.
2. Ensure free movement of hooks and counter weights before using the lifting beams. Periodically (once in a month), greasing and oiling should be done in moving parts of lifting beam. Pins of lifting hooks, counter weight and lifting chain/links should be checked for proper functional working condition. As counter weights are provided for engaging and disengaging function, it should be checked that it moves freely without any obstruction.
3. Actuating tests of limit switches should be conducted.
4. Actuating tests of brakes should be conducted.
5. All fuses in the control panel should be checked and if necessary it should be replaced.
6. Necessary terminal connections of motors, brakes, thrust or etc is to be checked.
7. Overload relay should be checked.
8. Visual inspection of wire ropes for any snapped loose wire and its proper lubrication.
9. Checking of rope clamps on the drum and tightening of bolts if required.
10. The Gantry crane should be made a trial run with a stop log hanging. It should be observed that no cables connecting the long travel mechanism or main hoist motor gets heated. If the cables get heated, the drawl current should be measured & if necessary suitable cable shall be replaced.
11. During trial it should be observed that the resistances do not get over heated. In that case proper designed stainless steel resistances should be replaced.
10. Gearbox assembly should not have any leakage of oil.  
Unusual noise/vibration if any should be checked and rectified before operation.
11. Crane should have interlocking system so that on one single operation namely hoisting, lowering forward or backward can only be affected at a time through the push button controller.
12. Hoisting and lowering motion should be carried out only after the crane is securely clamped to the rails.
13. Load on the crane at no time should exceed the safe working load.
14. Operator should be well conversant for operating the crane for various motions of the crane and under various loading conditions. The operator should check long travel, cross travel, hoist motion etc. The operator should never use limit switches as a normal means of stopping the hoist motion. Limit switches are only emergency devices.
15. No load should be left suspending from the crane.
16. Crane should not have excessive side play while in motion on the gantry rail.

17. Excessive sparking from any electrical devices, smoke from motors or brake drums if any should be rectified immediately.

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