



**DALMIA CEMENT (B) LIMITED – CEMENT PLANT
ARIYALUR
ELECTRICAL MANUAL**

Issue No:02	Rev. No: 00	Effective Date: 01.11.2019	SOP/Elect /17
Issued By:		Approved By: HOD - ELECTRICAL	
SOP For Overhauling of LT Motors			

Scope : This Procedure to establish and ensure safe method of Overhauling of LT Motors

Responsibility : Section Engineer – Electrical

Accountability : Section Head-Electrical

PPE:

1. Safety helmet,
2. Safety shoe,
3. Rubber Gloves.

Tools:

1. Insulated tools
2. Lifting Equipments
3. EOT Hoist

Hazard Analysis:

Risks associated

Injury
Electric shock

Mitigating Measures

Use of proper Handling equipments
Use of Proper Testing procedure & Insulated tools

Training needs:

1. Usage of tools and Nature of Hazards
2. Usage of PPEs

Procedure:

1. Take the LOTO permit for the particular Motor as per ELEC/SOP/003 and General Work permit.
2. Clean the Motor with Wire Brush, Hand Blower & Cloth, while cleaning use PPEs like Nose mask, goggles and hand Gloves.



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3. Clean the Motor Cooling Fans and Check the Condition of the Cooling Fan, while cleaning use PPEs like Nose mask, goggles and hand Gloves.
4. Discharge the Motor terminals after opening the terminal box Cover while opening, handle cover firmly.
5. Disconnect the motor power and earth connections after marking of connection while disconnecting, use proper tools.
6. Decouple the motor and dismantling coupling from the motor shaft with proper puller and tools.
7. Shift the Motor to dust free environment for overhauling. While shifting, handle the motor properly and avoid the fall of motor & tools. For shifting the motor use tested lifting equipment and other accessories.
8. Dismantle the Cooling fan cover and Cooling fan while dismantling, use proper tools.
9. Dismantle both end covers / shields and bearing housing while dismantling use proper tools.
10. Remove the rotor from stator body. While removing handle the rotor and tools firmly to avoid the stator winding damage.
11. Clean the rotor and stator winding with hand blower / cloth while cleaning use PPEs like Nose mask, goggles and hand Gloves.
12. Clean the End shields, cooling fan and cooling fan covers with hand blower / cloth. While cleaning use PPEs like Nose mask, goggles and hand Gloves.
13. Apply the varnish to the stator winding if required.
14. If varnish applied stator winding is to be dried out in the clean environment.
15. Assemble rotor in to the Stator body with proper tools. While assembling, handle the rotor firmly and avoid the stator winding damage.
16. Remove / Change the bearings if required to replace with proper puller and tools.
17. Apply the Grease in the Bearing housing and Bearings while apply avoid the spillage of grease on the ground.



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18. Assemble end covers and Bearing housing with proper tools and ensure no availability of foreign material in the stator body.
19. Assemble the cooling fan and cooling fan covers. While assembling, Use proper tools.
20. Check the Power Cable Connection Tightness & Condition of Terminal Block with proper tools.
21. Check the Insulation Resistance, Winding Resistance and Inductance of the Motor winding.
After checking the Insulation resistances again discharge the motor terminals.
22. Take no load trial if possible and use rubber Mat & Gloves for trial run.
23. Close the Motor Terminal box cover and box up with Silicon Paste to restrict the dust entry.
24. Shift the Motor to motor bed. While shifting, handle the motor properly and avoid the fall of motor & tools. For shifting the motor use tested lifting equipment and other accessories.
25. Assemble coupling on the motor shaft properly.
26. After mechanical alignment and coupling, Connect the motor power and earth connections as per marking. While connecting, use proper tools.
27. Clear the LOTO permit as per ELEC/SOP/004.

Take Trial if Possible and record all Check point in the concern Check list

Emergency / Emergency Shut OFF:

1. If electrical shock injury or body injury is there, give First aid and inform to the Safety department or Call Emergency number 3108/9865152222/9750963761.

Records/Annexure:

1. Refer LOTO permit.
2. JSA as enclosed below.



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JOB SAFETY ANALYSIS: (JSA)

Job Safety Analysis	Job: Overhauling of LT Motors	Date:	Analysis by:	Reviewed by:
Title of employee doing job: Electrician	Supervisor: Section Engineer	Department: Electrical	Section: Plant	Approved by:
Reqd./recommended PPE: Safety helmet, Safety shoe & Rubber Gloves, Cotton hand gloves.				
Sequence of Basic Job Steps	Potential Hazards	Recommended Safe Job Procedure	What Could Go Wrong	Corrective Action
Cleaning of Motors	Eye irritation of dust.	Wear goggles	Damaged goggles/non standard goggles/ Not wearing goggle	Periodic replacement / Proper training / Follow SOP
	Respiration problem of dust	Wear Nose mask	Damaged nose mask/Not wearing Nose mask	Periodic replacement/ Proper training/ Follow SOP
	Body injury	Wear safety helmet, safety shoes , hand gloves	Tools and material may fall on human body	Without PPE don't perform the job/ Proper training / Follow SOP
Open the motor terminal box cover to discharge	Electrical shock	Use Tested Electrical Rubber Hand gloves	Damaged Gloves/ Not checked before use	Periodic replacement/ To check for Damage before use
Cable disconnection and decoupling	Body injury	Wear safety helmet, safety shoes , hand gloves	Tools and material may fall on human body	Without PPE don't perform the job/ Proper training / Follow SOP
Shifting of Motor	Fall of object	Proper shifting method	Slip during shifting	Double holding method
Dismantling of motor	Injury due to striking	Proper dismantling methods	Slip of tools during striking	Usage of proper tools Tool box Pep talk
Heating of Bearings	Burn of old grease	Proper Heating method	Improper heating method	Usage of proper heating instruments
Applying Varnish	Unconsciousness	Proper Varnishing method	Release of Toxic gases during varnishing	Usage of quality varnish & Proper Varnishing method
Heating of Winding	Electric Shock	Proper heating method	Open ended terminals	To be take extra precaution during heating
Assembly of motor	Injury due to striking	Proper assembling methods	Slip of tools during striking	Usage of proper tools Tool box Pep talk



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Shifting, cable connection	Fall of object	Proper shifting method	Slip during shifting	Double holding method
	Body injury	Wear safety helmet, safety shoes , hand gloves	Tools and material may fall on human body	Without PPE don't perform the job/ Proper training / Follow SOP
Trial Run of Motor	Electric shock	Proper method for Trial run	Open ended terminals / Improper Earthing	Usage of proper trial methods & Ensuring proper earthing
	Motor dis-positioning / Run through	Proper method for Trial run	Un fixed motor base	Usage of fixing bolts Use rubber mat.
	Body injury due to loose clothing	Wear cover all suit, safety goggles, cotton clothes, safety shoes, safety helmet	Loose cloth may get caught with the rotating shaft makes severe injuries	before approach the motor, make sure of proper clothing and PPE