

# Long Term Motor Storage Procedure

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## Storage

Storage requirements for motors and generators that will not be placed in service for at least six months from date of shipment.

Improper motor storage will result in seriously reduced reliability and failure. An electric motor that does not experience regular usage while being exposed to normally humid atmospheric conditions is likely to develop rust in the bearings or rust particles from surrounding surfaces may contaminate the bearings. The electrical insulation may absorb excess moisture leading to motor winding failure.

A wooden crate "shell" should be constructed to secure the motor during storage. This is similar to an export box but the sides & top must be secured to the wooden base with lag bolts (not nailed as export boxes are) to allow opening and reclosing many times without damage to the "shell".

Minimum resistance of motor winding insulation is 5 Meg ohms or the calculated minimum, which ever is greater. Minimum resistance is calculated as follows:  $R_m = kV + 1$

where: ( $R_m$  is minimum resistance to ground in Meg-Ohms and  
 $kV$  is rated nameplate voltage defined as Kilovolts.)

Example: For a 480VAC rated motor  $R_m = 1.48$  meg-ohms (use  $5 M\Omega$ ).  
For a 4160VAC rated motor  $R_m = 5.16$  meg-ohms.

## **Preparation for Storage**

1. Some motors have a shipping brace attached to the shaft to prevent damage during transportation. The shipping brace, if provided, must be removed and stored for future use. The brace must be reinstalled to hold the shaft firmly in place against the bearing before the motor is moved.
2. Store in a clean, dry, protected warehouse where control is maintained as follows:
  - a. Shock or vibration must not exceed 0.15 in/sec (0.8 mils maximum at 60 hertz), to prevent the bearings from brinelling. If shock or vibration exceeds this, vibration isolation pads must be used.
  - b. Storage temperatures of 10°C (50°F) to 49°C (120°F) must be maintained.
  - c. Relative humidity must not exceed 60%.
  - d. Motor space heaters (when present) are to be connected and energized whenever there is a possibility that the storage ambient conditions will reach the dew point. Space heaters are optional.  
Note: Remove motor from containers when heaters are energized, reprotect if necessary.
3. Measure and record the resistance of the winding insulation (dielectric withstand) every 30 days of storage.
  - a. If motor insulation resistance decreases below the minimum resistance, contact your Baldor District office.
  - b. Place new desiccant inside the vapor bag and re-seal by taping it closed.
  - c. If a zipper-closing type bag is used instead of the heat-sealed type bag, zip the bag closed instead of taping it. Be sure to place new desiccant inside bag after each monthly inspection.
  - d. Place the shell over the motor and secure with lag bolts.
4. Where motors are mounted to machinery, the mounting must be such that the drains and breathers are fully operable and are at the lowest point of the motor. Vertical motors must be stored in the vertical position. Storage environment must be maintained as stated in step 2.
5. Motors with anti-friction bearings are to be greased at the time of going into extended storage with periodic service as follows:
  - a. Motors marked "Do Not Lubricate" on the nameplate do not need to be greased before or during storage.
  - b. Ball and roller bearing (anti-friction) motor shafts are to be rotated manually and greased in accordance with procedures stated in the manual provided with the motor.
  - c. Sleeve bearing (oil lube) motors are drained of oil prior to shipment.  
The oil reservoirs must be refilled to the indicated level with the lubricant stated in the manual provided with the motor. The shaft should be rotated monthly by hand at least 10 to 15 revolutions to distribute oil to bearing surfaces.
  - d. "Provisions for oil mist lubrication" – These motors are packed with grease. Storage procedures are the same as paragraph 5b.
  - e. "Oil Mist Lubricated" – These bearings are protected for temporary storage by a corrosion inhibitor. If stored for greater than 3 months or outdoor storage is anticipated, connected to the oil mist system while in storage. If this is not possible, add the amount of grease stated in the manual provided with the motor, then rotate the shaft 15 times by hand.

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6. All breather drains are to be fully operable while in storage (drain plugs removed). The motors must be stored so that the drain is at the lowest point. All breathers and automatic "T" drains must be operable to allow breathing and draining at points other than through the bearings around the shaft. Vertical motors should be stored in a safe stable vertical position.
  7. Coat all external machined surfaces with a rust preventing material. An acceptable product for this purpose is Exxon Rust Ban # 392.
  8. Carbon brushes should be lifted and held in place in the holders, above the commutator, by the brush holder fingers. The commutator should be wrapped with a suitable material such as cardboard paper as a mechanical protection against damage.

#### **Non-Regreaseable Motors**

Non-regreasable motors with "Do Not Lubricate" on the nameplate should have the motor shaft rotated 15 times to redistribute the grease within the bearing every 3 months or more often.

#### **All Other Motor Types**

Before storage, the following procedure must be performed.

1. Remove the grease drain plug, if supplied, (opposite the grease fitting) on the bottom of each bracket prior to lubricating the motor.
2. The motor with regreasable bearing must be greased as stated in the manual provided with the motor.
3. Replace the grease drain plug after greasing.
4. The motor shaft must be rotated a minimum of 15 times after greasing.
5. Motor Shafts are to be rotated at least 15 revolutions manually every 3 months and additional grease added every nine months (see Section 3) to each bearing.
6. Bearings are to be greased at the time of removal from storage.

#### **Removal From Storage**

1. Remove all packing material.
2. Measure and record the electrical resistance of the winding insulation resistance meter at the time of removal from storage. The insulation resistance must not be less than 50% from the initial reading recorded when the motor was placed into storage. A decrease in resistance indicates moisture in the windings and necessitates electrical or mechanical drying before the motor can be placed into service. If resistance is low, contact your Baldor District office.
3. Regrease the bearings as stated in the manual provided with the motor.
4. Reinstall the original shipping brace if motor is to be moved. This will hold the shaft firmly against the bearing and prevent damage during movement.
5. "Oil Mist Lubricated" – If bearings have been fully lubricated (step 5e), the motor must be taken to an authorized Baldor service center and thoroughly cleaned before being placed in service.



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