

Agricultural Engineering

EPP-3
A.W. Selders

ELECTRIC MOTORS - LUBRICATION AND CLEANING

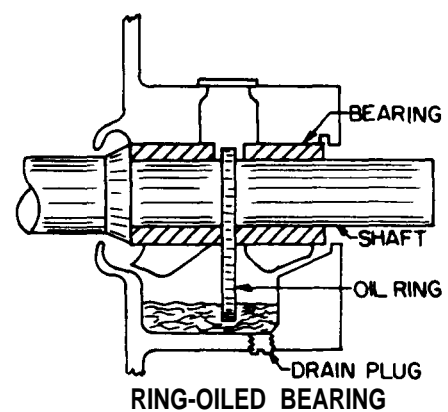
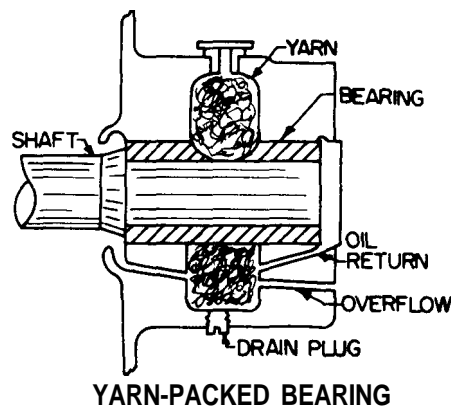
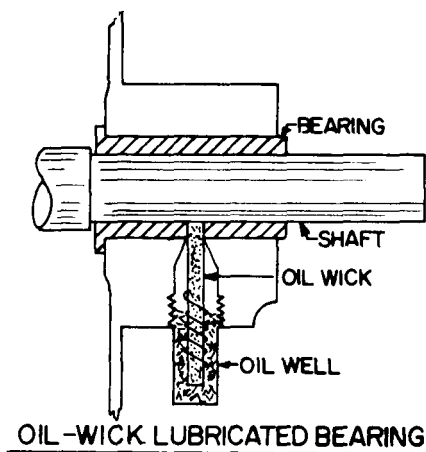
Lubrication

Proper lubrication of electric motors means the use of the right lubricant, in the right amount, and at the right time intervals. Manufacturer's directions should be followed closely. Common types of oiling systems used with sleeve-bearing motors are oil-wick, yarn-packed and ring-oiled. In general, a good grade of SAE 10 or 20 oil should be used for sleeve-bearings. Lighter or heavier oil may be used if temperatures are extremely high or low.

In the oil-wick system a wick is used to carry oil up to the shaft. The oil well should be unscrewed, the old oil cleaned out and the well refilled about two-thirds full with new oil about twice a year, or more often, depending on use of motor.

The yarn-packed system uses a yarn-packed bearing to which a few drops of oil should be added every few months. If a drain plug is present at the bottom, accumulated oil can be drained off occasionally.

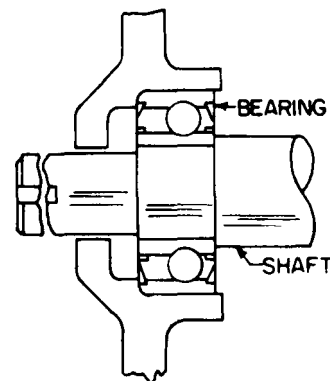
The ring-oiled system is usually used on larger sleeve-bearing type motors. Oil is carried from an oil reservoir below the bearing onto the shaft by a loose ring that turns as the motor runs. The oil level must be kept up to the filler hole by checking periodically. The old oil should be drained out, the reservoir flushed and new oil added every two to three years.



Ball-bearings for motors are usually either the relubricated or sealed type. The sealed type is prelubricated and sealed by the manufacturer and should not be disturbed. The other type can be relubricated, either by disassembling the motor, or through lubrication openings. Disassembled bearings should be wiped clean of old grease with a soft cloth and repacked half to two-thirds full with the type of electric-motor ball-bearing grease recommended by the manufacturer.



For bearings with lubrication openings, both the filler and drain plugs should be removed. Operating the motor will warm the old grease up so it flows out the drain. The motor is stopped and new grease added until the old has been forced out or the new starts to appear at the drain opening. The motor is operated again with both holes open to let the motor force out excess grease. Finally, remove an additional quantity of grease with a rod or wire to allow for expansion when the motor is operating and replace plugs.



SEALED TYPE BEARING

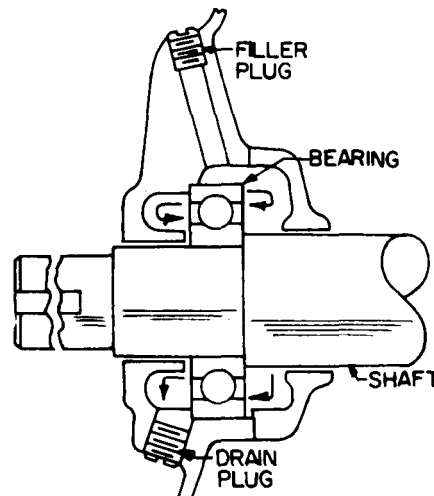
Some ball-bearing motors are relubricated with a grease gun containing special ball-bearing grease. It is important that too much grease is not applied in this manner.

Cleaning

Many general purpose electric motors have openings for ventilation. These openings allow dirt and foreign matter to enter the motor and cause trouble with the starting switch or brushes. Overheating may result from accumulation of dirt in the ventilation openings and wear is more rapid when dirt accumulates inside the motor. Motors should be inspected periodically to determine if a thorough cleaning is needed.

A simple procedure for cleaning most types of motors is as follows:

1. First, wipe the outside of the motor to remove all dirt and grease.
2. Before starting to disassemble the motor, mark the exact position of the end shields on the motor frame with a sharp center punch or file. This will permit reassembling the motor just as it was for true bearing alignment. Care must be used in disassembling to insure that damage is not done to parts.
3. Remove nuts and through bolts or cap screws holding the end shields and remove the rotor with its end shield. If the motor has brushes, these should be removed first to avoid breaking or damaging them when removing the rotor. Be careful not to tear the lead wires loose from the motor windings. Use special care in removing ball bearings if the motor is so equipped.
4. Compressed air at low pressure may be used, if available, to remove dust and loose dirt from inside the motor. A soft brush or a vacuum cleaner may also be used to clean out loose dirt.
5. Remove grease and oil with a safe cleaning solvent applied with a paint brush and wipe clean with a cloth. Avoid using excessive amounts of solvent directly on the windings as the insulation may be damaged.
6. On motors with sleeve bearings, remove the yarn or oil wick and wash out the oil well. It is advisable to replace the yarn or oil wick with new.
7. Repack ball bearings if motor is equipped with this kind. If ball bearings are sealed type, do not allow cleaning solvent to enter the bearings.
8. After all parts have been cleaned, wipe dry with a clean cloth.
9. Reassemble the motor carefully. Tighten bolts or cap screws gradually and evenly, being sure the end shields fit tightly all the way around.
10. Make sure the motor shaft turns freely and that motor leads are not in way of rotor fan or other moving parts.



LUBRICATED TYPE BEARING

Arthur W. Selders
 Arthur W. Selders
 State Extension Specialist
 Agricultural Engineering