INSTALLATION • OPERATION • MAINTENANCE

INSTRUCTIONS

HIGH THRUST BALL BEARING
TYPE CSP FAN-COOLED OR EXPLOSION-PROOF MOTORS
Frames 364 through 8120 Vertical

VERTICAL HOLLOW AND SOLID SHAFT FAN COOLED AND EXPLOSION PROOF MOTORS are designed for use on high thrust pump applications. Sturdy cast iron construction is employed throughout with the stator core completely encased in a cast iron frame. Brackets are cast solid and register directly in accurately machined fits in the frame. Explosion proof assemblies are so identified by an Underwriters' Label installed on the motor.

In all frame sizes, none of the internal parts are exposed to the external air.

Warranty. The Corporation in connection with apparatus sold agrees to correct any defect or defects in workmanship or material which may develop under proper or normal use during the period of one year from the date of shipment, by repair or by replacement f.o.b. factory of the defective part or parts, and such correction shall constitute a fulfillment of all the Corporation's liabilities in respect to said apparatus, unless otherwise stated in the quotation.

Any defects that may develop should be referred to the nearest Westinghouse Sales Office for complete servicing information.

RECEIVING

Unpack the motor and make certain that it was not damaged during shipment. Turn the shaft by hand to see that it turns freely.

Check to see that the nameplate data agrees with the voltage and frequency of the power supply provided for the motor.

On solid shaft motors, the extension is coated with a slushing compound to prevent rusting during shipment and storage. This slushing compound may be removed by wiping with turpentine or any petroleum solvent such as benzine, gasoline, Stoddard solvent, etc. See precautions under "Maintenance" for use of these solvents.

INSTALLATION

Mounting. Locate the motor in a place that is well-ventilated. If protecting shields or guards are used, they must not obstruct the free flow of air around the motor. The external air temperature should not exceed 40°C or 104°F, unless the motor has been specially designed or otherwise cleared for use in higher ambient.

Fasten to rigid foundation using bolts or screws of the largest size permitted by the drilling in the flange mounting.

Accurate alignment between motor and pump is of extreme importance. Misalignment will result in bearing trouble.

METHODS OF DRIVE

A. Hollow Shaft. The motor may be equipped with either ratchet or clutch type couplings (as specified by purchaser) as follows:

1. Ratchet Type. These motors are equipped with a non-reverse ratchet that permits rotation in the CCW direction only. The ratchet consists of a stationary member with teeth or steps cast into it and a rotating member with pins operating in vertical holes. When the motor starts in the forward or CCW direction, the inclined faces of the ratchet teeth throw the pins upward where they are held by centrifugal force and friction. When the motor stops, the pins drop and prevent CW or reverse rotation by striking the vertical faces of the teeth.

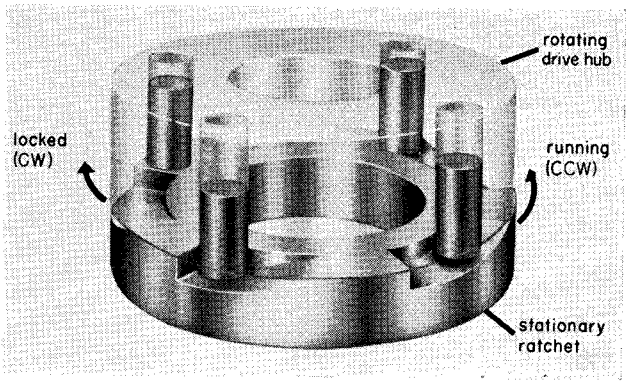

FIG. 1. Ratchet Assembly

2. Clutch Type. These motors are equipped with a disengaging clutch that consists of a coupling and a drive hub. The drive hub is keyed to the motor shaft, and the coupling is keyed to the pump shaft and attached through a screw to the adjusting nut. The coupling centers on the drive hub by means of a machined fit. The coupling is driven by two pins attached to the coupling and engaging corresponding holes in the drive hub. Disengagement of the clutch is caused by a lifting of the pump shaft which separates the pins in the coupling from the holes in the drive hub.

Both types of couplings above are bolted to drive hub at factory for shipping purposes.

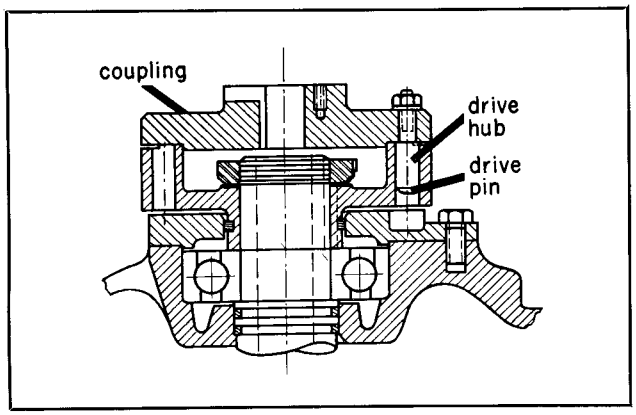

FIG. 2. Clutch Assembly

B. Solid Shaft. These motors are equipped with a shaft extension suitable for coupled service, and are either straight or tapered as selected by the purchaser.

Note: Coupling halves should have a close sliding fit on the shaft extension and must be securely locked to avoid hammering out in operation. If it is necessary to drive the part into position, it is important, that the end of the shaft opposite the extension be backed up so that the force of the blow is not taken in the bearing. Use a pinion puller for removing tight couplings.

Electrical Connections. Be sure the motor is connected as shown on the nameplate diagram, and and that the power supply (Voltage, Frequency and Number of Phases) corresponds with the nameplate data.

Connect to the power supply through a suitable switch and overload protection.

Install all wiring and fusing in accordance with the National Electric Code and local requirements.

To change the direction of rotation three-phase motors, interchange any two line leads.

To change the direction of rotation on two-phase motors, interchange the line leads of either phase.

Conduit Box. The conduit box may be rotated 90 or 180 degrees for use with horizontal conduit or conduit from above.

OPERATION

Run the motor without load to check the connections and direction of rotation.

The motor will operate satisfactorily with a 10 percent variation in voltage, a 5 percent variation in frequency or a combined voltage and frequency variation of 10 percent, but not necessarily in accordance with the standards of performance established for operation at normal rating.

DESCRIPTION OF BEARINGS

Top Bearings. In the top assembly, the angular contact bearings are mounted singularly, tandem or face to face. The bearing is oil lubricated and the oil pot is cooled by means of the motor cooling air passing over the outside of the pot.

Caution: Do not run motor until bearing housings have been filled to proper level with oil (see lubrication) and allowed to stand for 15 minutes to meter oil into the bearings.

Lower Bearing. The lower bearing is a standard radial type ball bearing, oil lubricated or presealed grease lubricated.

Motors equipped with prelubricated bottom bearings do not have lubrication fittings thereon.

LUBRICATION

Frames 364 thru 405. With motor at standstill fill bearing reservoir with a good grade of lubricating oil having a viscosity equivalent to S.A.E. #10W. This is done by pouring the oil in through the filling cup until no more can be added. Before starting motor close the filling cup by screwing in the hinged threaded plug tightly with the fingers.

Every six months the oil reservoirs should be drained by using a syringe to remove the oil at the oil filling cup. The cup may also be rotated 180° or removed to drain the oil. However, if this procedure is followed the threads of the coil cup should be resealed with plumbers cement to prevent leakage.

Frames 444 thru 8120. Use a good grade of S.A.E. 10W for ball bearings. Refer to lubrication nameplate on motor.

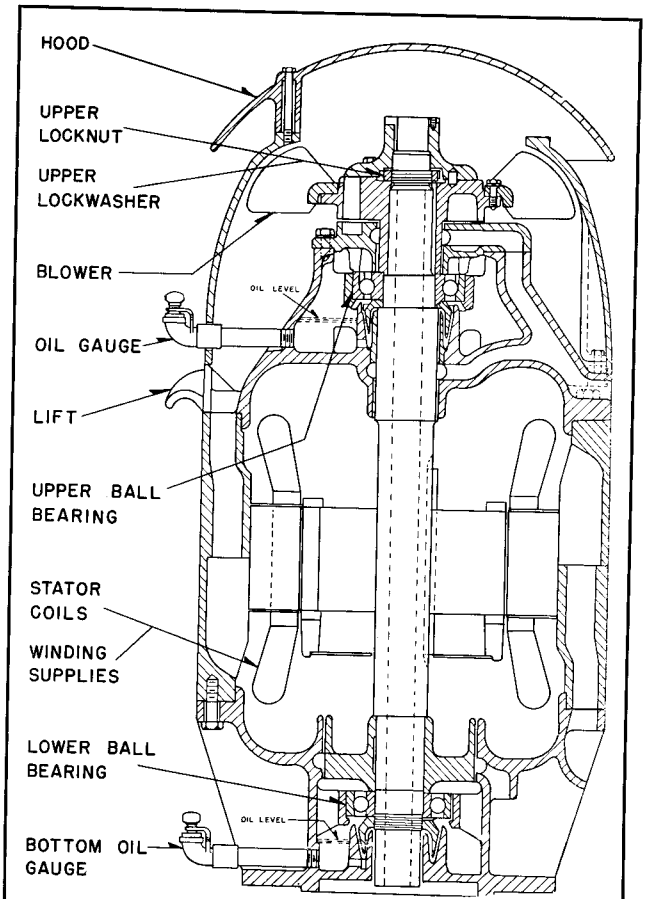

FIG. 3. Motor A.C. Frames 364 to 405—Hollow or Solid Shaft Fan-Cooled or Explosion-Proof

To fill the upper and lower oil pot, remove the cap and fill to oil gage mark. In operation the oil level will rise. Models equipped with Presealed Bottom bearings do not have lubrication fitting thereon.

Every six months the oil reservoirs should be drained by removing the drain plugs at the end of the drain or in the bottom of the oil gages.

DISMANTLING AND RE-ASSEMBLY OF MOTOR

Frames 364 thru 405 (Per Fig. 3).

1. Remove drip cover, hood and coupling.

2. Remove nut and lockwasher from top of shaft and remove drive hub and cover plate.

3. Remove bolts between upper bracket and frame. Pull upper bearing with the bracket being used as part of the bearing puller. Lift bracket from frame.

4. Lift rotor and lower bearing assembly.

5. Separate frame and lower bracket.

To re-assemble reverse the above procedure.

Frames 444 thru 8120 (Per Fig. 4).

1. Remove hood, fan, coupling and cover plates so that upper bearing assembly is exposed.

2. Remove nut and lockwasher from top of shaft and assemble 3/4 inch eye bolts in two tapped holes in top of runner.

3. Pull runner and bearings from shaft. Runner fit on shaft is a light tapping to a sliding fit .0005 to .0022 inches loose.

4. Remove bolts between upper bracket and frame and key in top of shaft.

5. Lift top bracket from frame.

6. Lift rotor and lower bearing assembly.

7. Separate frame and lower bracket.

To re-assemble reverse the above procedure.

MAINTENANCE

Inspection. Although Life-Line motors require a minimum of attention in service, they should be inspected at regular intervals to check for excessive (1) dirt, (2) moisture, (3) friction and (4) vibration, which account for 90 percent of all motor failures.

1. Guard Against Dirt. Prevent excessive build up of dirt on the motor exterior by blowing it off or brushing it clean.

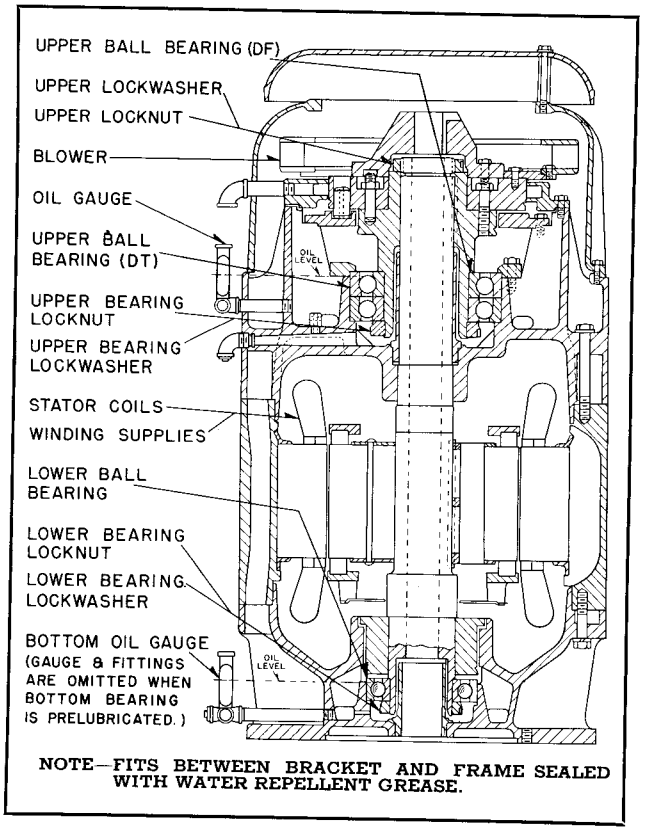

FIG. 4. Motor A.C. Frames 444 thru 8120—Hollow or Solid Shaft-Type "CSP" Fan-Cooled or Explosion-Proof

Do not inspect the motor interior unless the motor is dismantled for other reasons. If necessary to dismantle a motor in the field for servicing, upon reassembly, it is imperative that the factory assembly be duplicated in all respects.

Where grease or oil is present, wipe with a cloth moistened (but not dripping) with a petroleum solvent of a "safety type" such as Stoddard solvent or similar materials available under various trade names. Wear suitable gloves to prevent skin irritation when using these petroleum solvents.

Petroleum solvents are flammable but relatively non-toxic.

2. Guard Against Moisture. The insulation resistance of stand-by motors should be checked with a "megger" at regular intervals to detect the presence of moisture in the windings. If the insulation resistance shows an appreciable decrease, the windings should be dried out by any suitable means before applying power to the motor. This is particularly important in installations where the ambient temperature is subject to frequent, sharp fluctuations, or where the atmosphere is unusually damp. For less severe locations, running standby motors, at least once a week should protect the windings from moisture absorption or condensation.

3. Guard Against Friction. Excessive friction or overheating of bearings is usually traced to one of the following causes:

a. Poor alignment causing excessive vibration or binding.

b. Bent shaft.

c. Excessive end or side thrust due to gearing, flexible couplings, etc.

4. Guard Against Vibration. To avoid failures due to vibration, a few simple checks should be made regularly.

Check for misalignment such as may be caused by foundation settling or heavy floor loading. These may be causing vibration through misalignment.

Check to see if vibration from the pump is being transmitted to the motor.

Check the motor mounting bolts and bracket bolts to be sure they are tight.

Coils. Revarnishing the windings when motors are overhauled will lengthen their life. Suitable varnish may be obtained from the nearest Westinghouse Sales Office.

RENEWAL PARTS

Renewal Parts information may be obtained from the nearest Westinghouse Sales Office. Be sure to name the part or parts required (see Figs. 1 and 2) and give complete nameplate reading on the motor for positive identification.

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