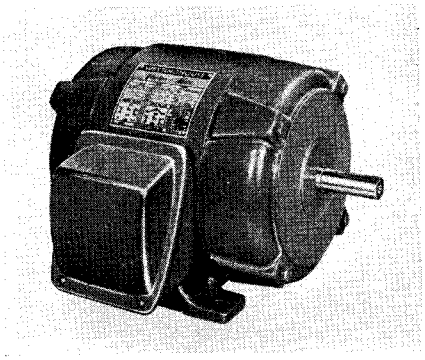
INSTALLATION • OPERATION • MAINTENANCE

INSTRUCTIONS

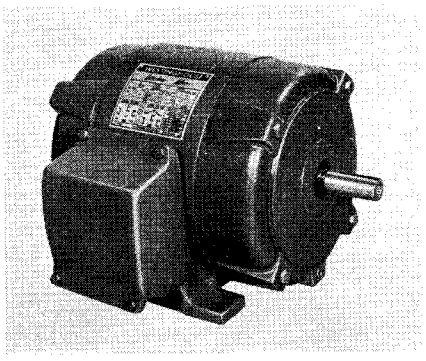
SQUIRREL-CAGE *Life-Line*® MOTORS

TYPE A, FOR NAVY SERVICE

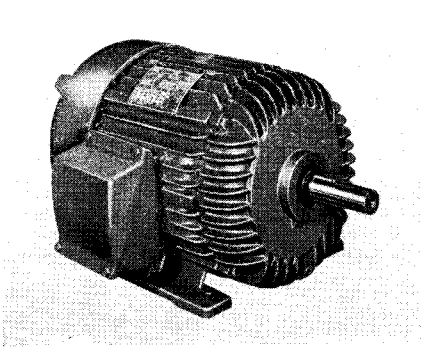
(Frames 182 through 326U with Ball Bearings)



Drip-Proof
(Model No's. ending in DP and OD)



Totally Enclosed Non-Ventilated
(Model No's. ending in NV and AM)



Totally Enclosed Fan-Cooled
(Model No's. ending in FC and WP)

1.0 INTRODUCTION

1.1 General Life Line Type A Squirrel-Cage Induction Motors in frames 182 through 326U are designed for a wide variety of constant-speed applications. Nodular iron construction is employed throughout, with the stator core completely encased in a solid frame.

1.2 Dripproof Motors. Drip-proof brackets provide maximum protection to internal parts of the motor. Ventilation openings in lower portions of bracket only, afford liberal passages for circulating cooling air.

1.3 Totally Enclosed Motors. Brackets for the enclosed machines are cast solid and register directly in accurately machined rabbet fits in the frame. Non-ventilated motors have no fan or fan guard. In all enclosed motors, none of the internal parts are exposed to the external air.

1.4 Totally Enlcosed Fan-Cooled Motors. Fan cooled motors have an aluminum fan at the front end, protected by a corrosion-resisting hood. The fan is securely clamped on the shaft and propels a stream of cooling air over external ribs on the frame surface.

2.0 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.

Shaft 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.

3.0 INSTALLATION

3.1 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 that specified on the nameplate.

Fasten to a rigid foundation using bolts or screws of the largest size permitted by the drilling in the mounting feet. The motor must rest evenly on all four foot pads.

For wall or ceiling horizontal mounting, the end brackets of drip-proof motors should be rotated 90° or 180° to maintain normal drip-proof protection. Similar rotation may be done on enclosed brackets where it is desired to keep the drain plug in the brackets at the bottom of the motor. All brackets have sturdy projecting lugs to permit ready removal.

Motors which have sealed prelubricated ball bearings, may be mounted at any desired odd angle, providing decreased drip-proof protection or reduced drain effectiveness is not detrimental.

3.2 Method of Drive. Any of the following drive methods may be used depending on the particular motor application:

3.2.1 V-BELT DRIVE. Mount the motor on the slide rails or bedplate, which allows for adjusting the belt tension.

Mount the motor sheave close to the bearing housing allowing sufficient clearance for rotor end play.

The smallest sheave should not be less in diameter than that recommended by the belt manufacturer for the belt used.

Sheaves should be carefully alinged. Belt tension should be just sufficient to eliminate excessive sag in the slack side of the belt. V-belts do not require as much tension as flat belts.

3.2.2. CHAIN DRIVE. Mount the motor on the slide rails or bedplate, which allows for adjusting the chain tension.

Mount the motor sprocket close to the bearing housing, allowing sufficient clearance for the rotor end play.

3.2.3 GEAR DRIVE. Mount the motor and driven unit so as to maintain accurate alignment. The gears must mesh accurately to prevent vibration.

Mount the motor gear close to the bearing housing to minimize the overhang, allowing sufficient clearance for rotor and play.

Dowel the motor to the base.

3.2.4. DIRECT DRIVE. The motor shaft and driven shaft must be carefully aligned.

Dowel the motor to the base.

Note: Pulleys, pinions or 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, on ball bearing motors, 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 pulleys.

3.3 Electrical Connections. Be sure the motor is connected as shown on the nameplate diagram, 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 overlaid protection.

Install all wiring and fusing in accordance with military requirements and specs.

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

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

3.4 Conduit Box. If the conduit box is desired on the opposite side of the motor, remove the brackets and rotor, reverse the frame, and reassemble.

The conduit box is mounted on the horizontal centerline, and may be rotated in steps of 90° to receive conduit from any of four directions.

When the motor is mounted on a bedplate or on slide rails for belt adjustment, flexible metallic conduit should be used to protect the incoming cable.

In making this connection a squeeze connector should be used for attaching the flexible conduit to the motor box. Squeeze connectors may be straight, 45° or 90°.

4.0 OPERATION

4.1 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.

5.0 MAINTENANCE

5.1 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.

5.1.1 GUARD AGAINST DIRT. Keep the insulation and mechanical parts of the motor clean. Dust that is free from oil or grease may be removed by wiping with a clean, dry cloth, or preferably, by suction. Dust may be blown from inaccessible parts with clean, dry air, using not more than 30 to 50 pounds pressure. Use care to prevent personal injury from flying particles.

When 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.

5.1.2 GUARD AGAINST MOISTURE. Care should be taken to protect drip-proof motors from accidental hosing.

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 instal-

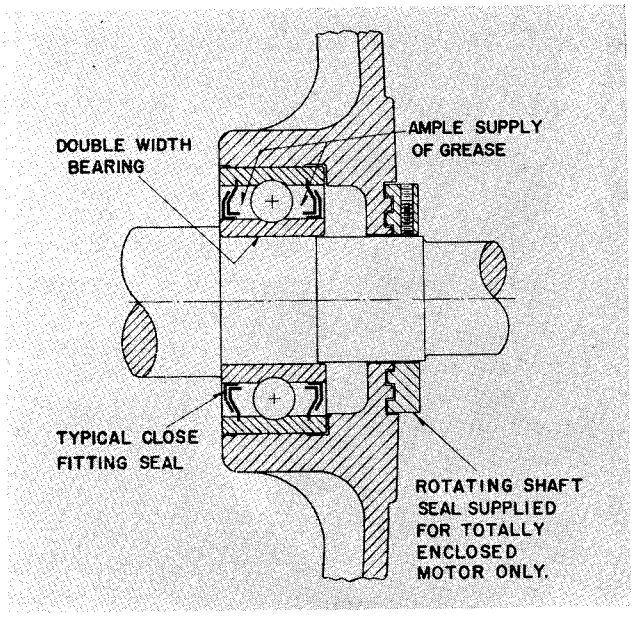


Fig. 2. Sectional View
Prelubricated Ball Bearing

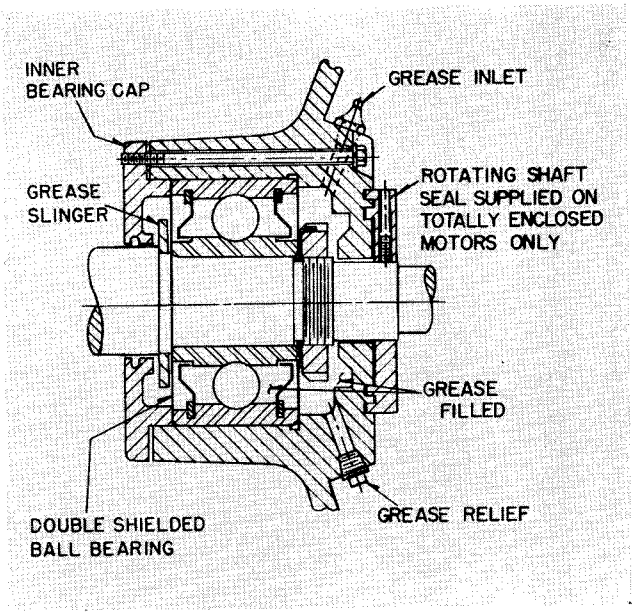


Fig. 3. Sectional View
Greasable Bearing Assembly

lations where the ambient temperature is subject to frequent, sharp fluctuations, or where the atmosphere is unusually damp. For less severe locations, running stand-by motors at least once a week should protect the windings from moisture absorption or condensation.

Before motor windings are blown out with air make sure that water has not condensed in the air line.

5.1.3 GUARD AGAINST FRICTION. Excessive friction or overheating of bearings is usually traced to one of the following causes:

a. Excessive belt tension.

b. Poor alignment causing excessive vibration or binding.

c. Bent shaft.

d. Excessive and or side thrust due to gearing, flexible couplings, etc.

5.1.4 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 driven machine is being transmitted to the motor.

Check for excessive belt or chain tension or the push-apart effect inherent in spur gears.

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

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

5.3 Bearings. (See Figure 2). The bearings used in Life-Line motors are packed at the factory with the proper amount of lubricant; no further lubrication is needed for the normal life of the bearings.

A specially selected grease having a high degree of stability is permanently sealed in the bearings. The grease has been proven by tests both in the laboratory and the field for long service.

These prelubricated bearings have an improved double seal on each side for keeping out foreign material and retaining the lubricant.

5.3.1 BEARINGS. (See Figure 3). When shipped from the factory, grease lubricated ball bearing motors have sufficient quantity of the proper grade grease to last for a long period. This period will vary depending on the application. When regreasing stop motor, remove drain plug, add grease (with hand operated gun only) until grease appears at drain hole. Run motor for approximately ten minutes before replacing drain plug. It is recommended for easy applications no lubricant be added, for average applications motor be lubricated every three to six years, and for severe applications, greasing be done on the basis of experience.

6.0 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. 4 and 5) and give complete nameplate reading on the motor for positive identification.

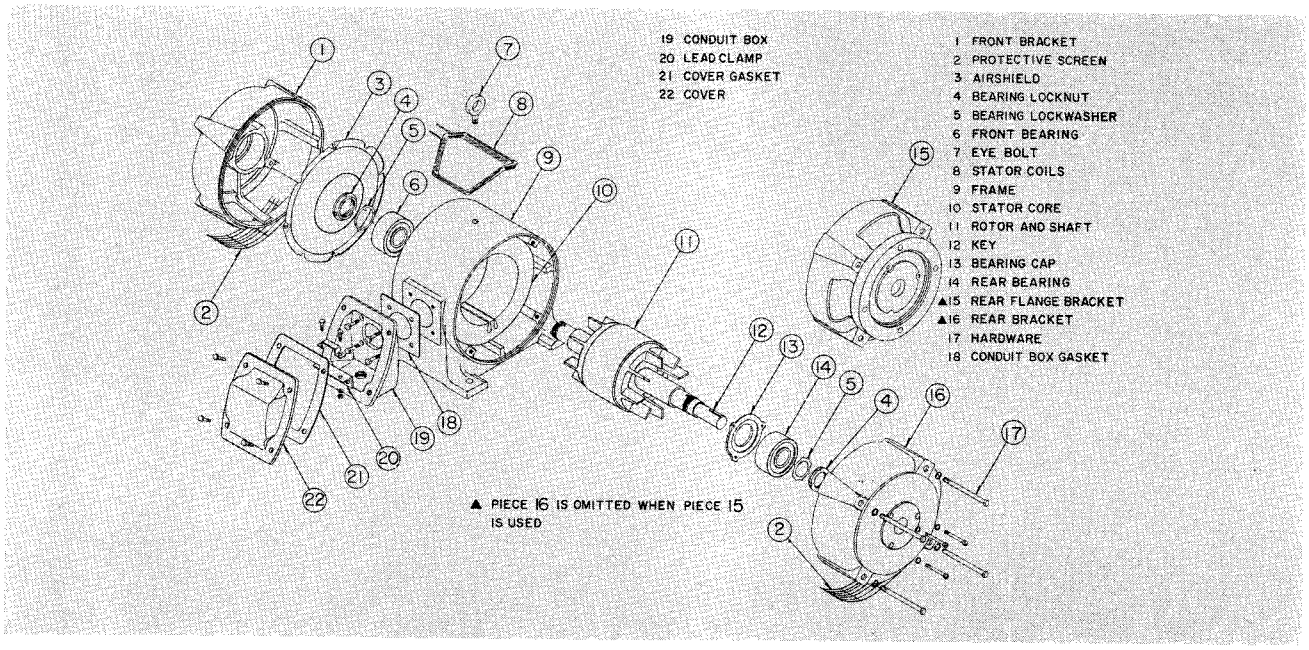


FIG. 4. Arrangement of Parts*—Drip-Proof Motors

Note: Totally enc losed non-ventilated motors use same parts as drip-proof except front air shield is not used, brackets are cast solid and when water tight or spraytight, a revolving seal is mounted at rear-end and fits between brackets and frames are sealed with water repellent grease.

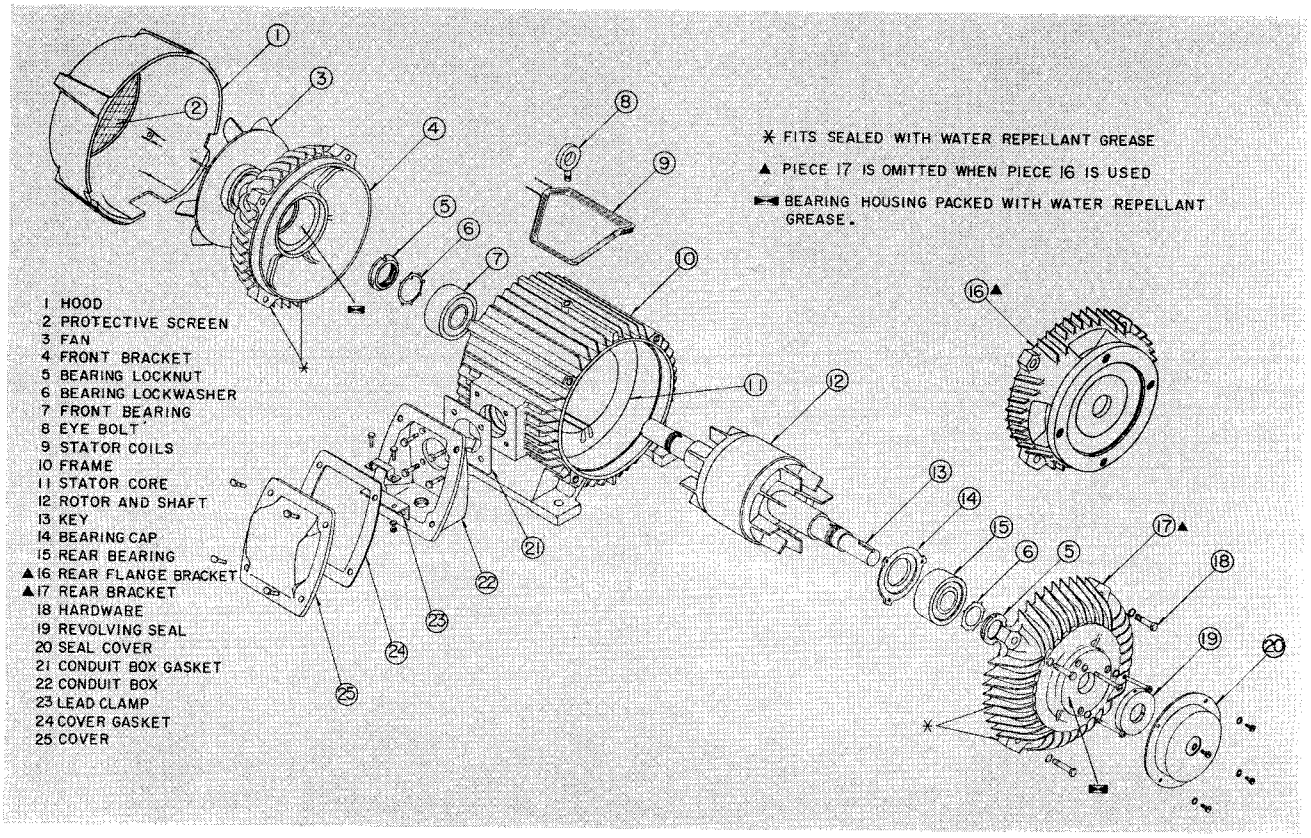


FIG. 5. Arrangement of Parts*—Totally Enclosed Fan-Cooled Motors

Note: Fits between brackets and frame sealed with water repellent grease; some totally enclosed non-ventilated motors use same parts as totally enclosed fan-cooled except without fan and hood.

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