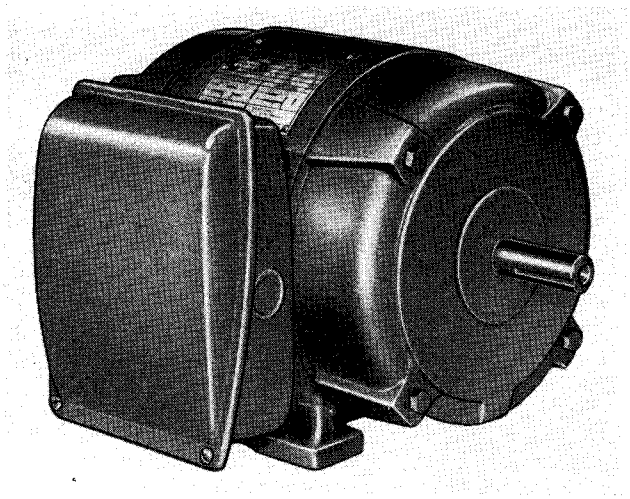
INSTALLATION • OPERATION • MAINTENANCE

INSTRUCTIONS

TYPE A SINGLE-PHASE Life-Line* MOTORS

(Frames 182 through 326U with Prelubricated Ball Bearings)



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

LIFE-LINE TYPE A SINGLE-PHASE INDUCTION MOTORS in NEMA frames 182 through 326U are designed for a wide variety of constant-speed applications. These are furnished in Model AL, capacitor-start induction-run and Model AM, capacitor-start capacitor-run.

In the Model AL motor, when a predetermined speed is reached, the starting capacitor and its winding are disconnected from the circuit by the switching mechanism. The motor then operates on the running winding.

In the Model AM motor when the transfer speed is reached, the switching mechanism operates and disconnects the starting capacitor, but the running capacitor and its winding remain in the circuit while running.

Both types of motor utilize a simple, rugged squirrel-cage rotor.

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

Brackets for the enclosed machines are cast solid and register directly in accurately machined rabbet fits in the frame. Fan-cooled motors have a glass-reinforced Moldarta 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. Non-ventilated motors have no fan or fan guard. In all enclosed motors, 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. Many of these motors are subject to the Integral HP Motor Repair Plan, details of which may also be obtained from your nearest Westinghouse Sales Office.

RECEIVING

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

Check to see that the nameplate data agrees with the voltage and frequency of the power supply provided for the motor and that the horsepower rating is correct for the load.

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

INSTALLATION

Mounting. Locate the motor in a clean, dry, well ventilated place. 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.

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

Unless otherwise specified when ordering, all motors are assembled for floor mounting. If the motor is to be mounted on a side wall or ceiling, the end brackets should be loosened and rotated 90° or 180° so that the vent holes are at the bottom. 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.

Rotate the brackets on the front end carefully since there are leads connecting the switch in the front bracket to the conduit box. These leads must not touch any rotating part when the motor is running. All brackets have sturdy projecting lugs to permit ready removal.

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

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

1. ***V-Belt Drive.*** Mount the motor on the slide rails or bedplate, which allows for adjusting the belt tension.

* Trade Mark

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 and in no case smaller than that indicated in Table 1.

Sheaves should be carefully aligned. 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.

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 rotor end play, and align the sprockets accurately.

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 end play.

Dowel the motor to the base.

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.

Table No. 1
SHEAVE SIZE FOR V-BELT DRIVES

MOTOR FRAME	SHEAVE DIMENSIONS	
	Min. Pitch Diam. (inches)	Max. Width (inches)
182	2¼	3
184	2½	3
213	2½	3
215	2½	3½
254U	3	3½
256U	3	5½

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. Refer to the nameplate for rotation connections.

Connect the motor to the line through a suitable switch and overload protector.

Install all wiring and fusing in accordance with the National Electric Code and local requirements. Motor frames should be grounded in accordance with the requirements of the National Electric Code.

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. A stationary switch is mounted in the front bracket with leads running to the conduit box. These leads can be pulled out of the conduit box after disconnecting the capacitors, and re-entered from the opposite end of the frame. See instructions under "Disassembly".

When it is desired to extend conduit from above, loosen the four screws and disconnect the capacitor leads. The box can then be turned 90° so that a knockout or hole will be on top; conduit should be adequately sealed to box to keep out liquids.

When the motor is mounted on a bedplate or on slide rails for belt adjustment, use flexible metallic conduit to protect the leads to the motor. Attach the flexible conduit to the conduit box with squeeze connectors.

OPERATION

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

The motor will operate satisfactorily with a 10% variation in voltage, a 5% variation in frequency, or a combined voltage and frequency variation of 10%, but not necessarily in accordance with the standards of performance established for operation at normal rating. Low voltage reduces the torque. High voltage lowers the power factor and may endanger the capacitors.

The motor should quickly attain full speed under conditions of normal line voltage and rated load.

Thermal Protection. For protection against common causes of failure, these motors are sometimes equipped with a Thermoguard which is an inherent protection type device. The Thermoguard when provided with the motor, is indicated on the nameplate and is mounted in the front bracket. There are two types as described below.

Automatic Thermoguard. The automatic Thermoguard opens the circuit to the motor under conditions of dangerous heat and recloses the circuit when the motor has cooled to a safe temperature. CAUTION: When unexpected starting would be dangerous, do not use Automatic type.

This Thermoguard protects against:

1. Continuous or frequently repeated overloads.
2. Excessive temperatures.
3. Failure of ventilation.

Manual Reset Thermoguard. This Thermoguard opens the circuit automatically but the reset button must be pressed to reclose the circuit. This button is conveniently located on the front bracket.

This Thermoguard protects against:

1. Continuous or frequently repeated overloads.
2. Jamming of motor drive.
3. Inability to start or run due to low voltage.
4. Excessive temperature.
5. Failure of ventilation.

These two types of Thermoguard are interchangeable on many ratings. Consult the nearest Westinghouse District Office for instructions and procurement of the required type of Thermoguard. They are supplied as complete units only.

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.*** 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

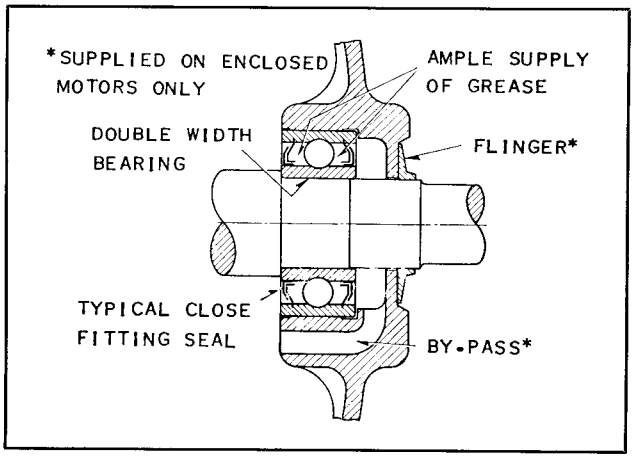


FIG. 1. Sectional View—Prelubricated Ball Bearing

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.*** 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 installations 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.

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 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 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 belts 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.

Bearings. (See Figure 1) 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. The bearing housing design for enclosed motors includes a bypass to minimize the infiltration of contaminated air through the bearing. This by-pass is arranged that it also serves as a drain for the bearing housing; hence, when enclosed motors are installed for horizontal side-wall or ceiling mounting in very wet locations, it is recommended that the brackets be rotated to keep the by-pass at the bottom. A typical bearing assembly is shown in Fig. 1.

Disassembly. The Model AL and AM motors in many frame sizes are equipped with a ventilation blower. Since the blower may be larger than the stator bore, the rotor is best removed in the following manner.

First ascertain at which end of the motor the blower is located. Remove the four bolts holding the bracket on blower end. Strike lugs on bracket a few times with a mallet. This will loosen the bracket from the frame, and bracket and rotor complete with bearings and blower can then be withdrawn by hand.

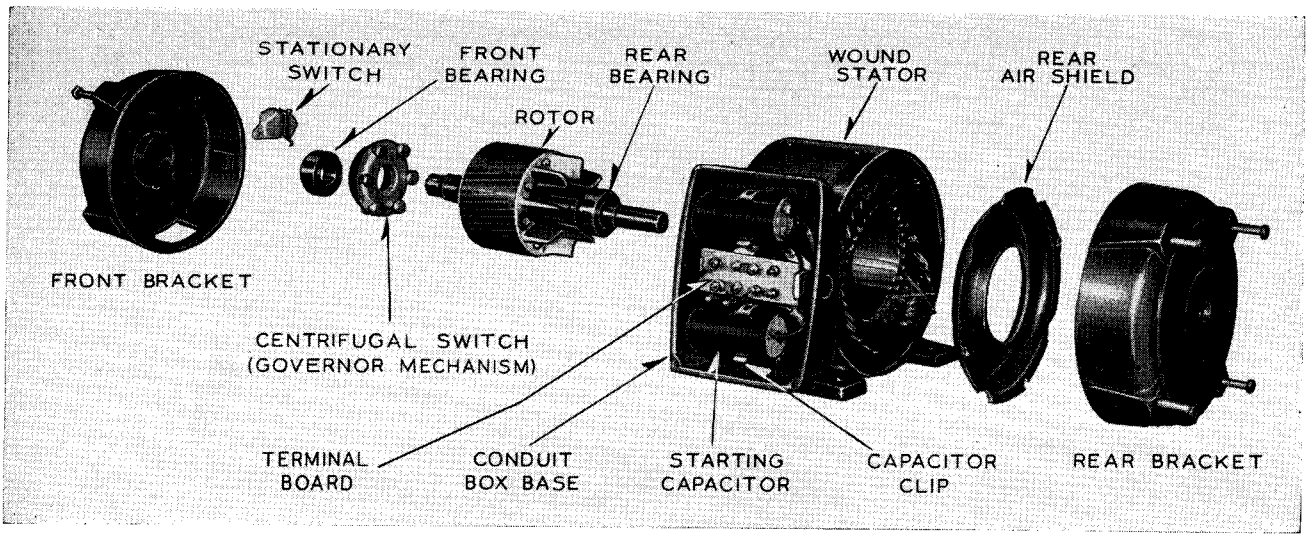


FIG. 2. Arrangement of Parts—Drip-proof Motor

When removing the rotor be sure to support it so that the rotor or shaft extension does not rub on the stator windings and damage them.

Observe the number and location of any shims or springs present in the brackets.

When reassembling the motor, wipe all excessive grease, dirt, or foreign material out of the bracket bearing housing. Replace shims or springs exactly as found and reassemble. Turn the shaft by hand; if it turns freely the assembly is correct.

Capacitors. The Model AL motor is furnished with starting capacitors only, located in the conduit box. These capacitors are in insulated containers held in place in the conduit box by a clamp. Continuous, frequent starting or high ambient temperature may damage the starting capacitors. These capacitors are intermittently rated and permit 20 motor starts per hour when each start has a three second accelerating time.

Centrifugal Switch. On those motors where the switching mechanism is a centrifugal switch, it functions to disconnect the starting capacitors when the motor has reached a predetermined speed. On the Model AL the starting winding is also disconnected. On the Model AM motor the running capacitor and winding remain in the circuit and function during the normal operation of the motor. Figure 3 shows the complete rotor with the governor mechanism in place, with the contacts part of the switch in its relative position.

The centrifugal switch consists of two parts: contacts and governor mechanism. The contacts are stationary and are located in the front bracket. The governor mechanism is pressed on the shaft and rotates with it. When a predetermined speed is reached, the governor opens the contacts and disconnects the starting capacitors as previously described.

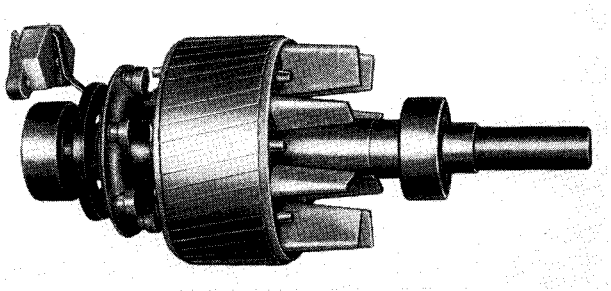


FIG. 3. Complete Rotor with Governor Mechanism of the Centrifugal Switch in Place and Contact Assembly in Relative Position

The governor mechanism has a definite location on the shaft, which is held to a close tolerance necessary for correct operation. If this part is ever replaced, the new one must be installed in the exact location of the old one. Care must be taken not to bend it. The contacts part can easily be replaced by soldering on two wires and attaching it to the bracket with two small screws. These parts are designed for long life and should rarely need to be replaced.

RENEWAL PARTS

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

WESTINGHOUSE ELECTRIC CORPORATION
BUFFALO PLANT • MOTOR AND CONTROL DIVISION • BUFFALO 5, N.Y.
Printed in U.S.A.

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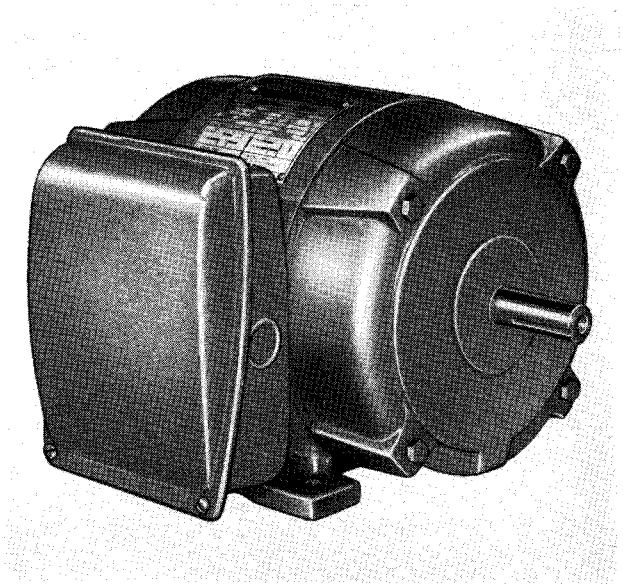

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In the Model AM motor when the transfer speed is reached, the switching mechanism operates and disconnects the starting capacitor, but the running capacitor and its winding remain in the circuit while running.

Both types of motor utilize a simple, rugged squirrel-cage rotor.

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

Brackets for the enclosed machines are cast solid and register directly in accurately machined rabbet fits in the frame. Fan-cooled motors have a glass-reinforced Moldarta 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. Non-ventilated motors have no fan or fan guard. In all enclosed motors, none of the internal parts are exposed to the external air.

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RECEIVING

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

Check to see that the nameplate data agrees with the voltage and frequency of the power supply provided for the motor and that the horsepower rating is correct for the load.

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

INSTALLATION

Mounting. Locate the motor in a clean, dry, well ventilated place. 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.

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

Unless otherwise specified when ordering, all motors are assembled for floor mounting. If the motor is to be mounted on a side wall or ceiling, the end brackets should be loosened and rotated 90° or 180° so that the vent holes are at the bottom. 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.

Rotate the brackets on the front end carefully since there are leads connecting the switch in the front bracket to the conduit box. These leads must not touch any rotating part when the motor is running. All brackets have sturdy projecting lugs to permit ready removal.

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

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

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 and in no case smaller than that indicated in Table 1.

Sheaves should be carefully aligned. 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.

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 rotor end play, and align the sprockets accurately.

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 end play.

Dowel the motor to the base.

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.

Table No. 1
SHEAVE SIZE FOR V-BELT DRIVES

MOTOR FRAME	SHEAVE DIMENSIONS	
	Min. Pitch Diam. (inches)	Max. Width (inches)
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184	2½	3
213	2½	3
215	2½	3½
254U	3	3½
256U	3	5½

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. Refer to the nameplate for rotation connections.

Connect the motor to the line through a suitable switch and overload protector.

Install all wiring and fusing in accordance with the National Electric Code and local requirements. Motor frames should be grounded in accordance with the requirements of the National Electric Code.

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. A stationary switch is mounted in the front bracket with leads running to the conduit box. These leads can be pulled out of the conduit box after disconnecting the capacitors, and re-entered from the opposite end of the frame. See instructions under "Disassembly".

When it is desired to extend conduit from above, loosen the four screws and disconnect the capacitor leads. The box can then be turned 90° so that a knockout or hole will be on top; conduit should be adequately sealed to box to keep out liquids.

When the motor is mounted on a bedplate or on slide rails for belt adjustment, use flexible metallic conduit to protect the leads to the motor. Attach the flexible conduit to the conduit box with squeeze connectors.

OPERATION

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

The motor will operate satisfactorily with a 10% variation in voltage, a 5% variation in frequency, or a combined voltage and frequency variation of 10%, but not necessarily in accordance with the standards of performance established for operation at normal rating. Low voltage reduces the torque. High voltage lowers the power factor and may endanger the capacitors.

The motor should quickly attain full speed under conditions of normal line voltage and rated load.

Thermal Protection. For protection against common causes of failure, these motors are sometimes equipped with a Thermoguard which is an inherent protection type device. The Thermoguard when provided with the motor, is indicated on the nameplate and is mounted in the front bracket. There are two types as described below.

Automatic Thermoguard. The automatic Thermoguard opens the circuit to the motor under conditions of dangerous heat and recloses the circuit when the motor has cooled to a safe temperature. CAUTION: When unexpected starting would be dangerous, do not use Automatic type.

This Thermoguard protects against:

1. Continuous or frequently repeated overloads.
2. Excessive temperatures.
3. Failure of ventilation.

Manual Reset Thermoguard. This Thermoguard opens the circuit automatically but the reset button must be pressed to reclose the circuit. This button is conveniently located on the front bracket.

This Thermoguard protects against:

1. Continuous or frequently repeated overloads.
2. Jamming of motor drive.
3. Inability to start or run due to low voltage.
4. Excessive temperature.
5. Failure of ventilation.

These two types of Thermoguard are interchangeable on many ratings. Consult the nearest Westinghouse District Office for instructions and procurement of the required type of Thermoguard. They are supplied as complete units only.

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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.

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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

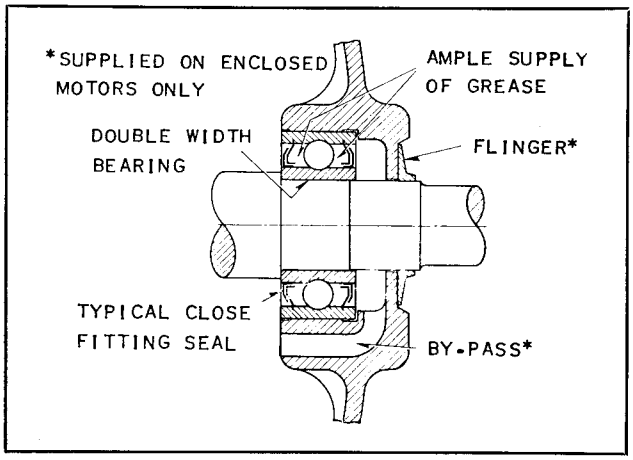

FIG. 1. Sectional View—Prelubricated Ball Bearing

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.*** 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 installations 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.

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 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 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 belts 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.

Bearings. (See Fig. 1) 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. The bearing housing design for enclosed motors includes a bypass to minimize the infiltration of contaminated air through the bearing. This by-pass is arranged that it also serves as a drain for the bearing housing; hence, when enclosed motors are installed for horizontal side-wall or ceiling mounting in very wet locations, it is recommended that the brackets be rotated to keep the by-pass at the bottom. A typical bearing assembly is shown in Fig. 1.

Disassembly. The Models AL and AM motors in many frame sizes are equipped with a ventilation blower. Since the blower may be larger than the stator bore, the rotor is best removed in the following manner:

First ascertain at which end of the motor the blower is located. Remove the four bolts holding the bracket on blower end. Strike lugs on bracket a few times with a mallet. This will loosen the bracket from the frame, and bracket and rotor complete with bearings and blower can then be withdrawn by hand.

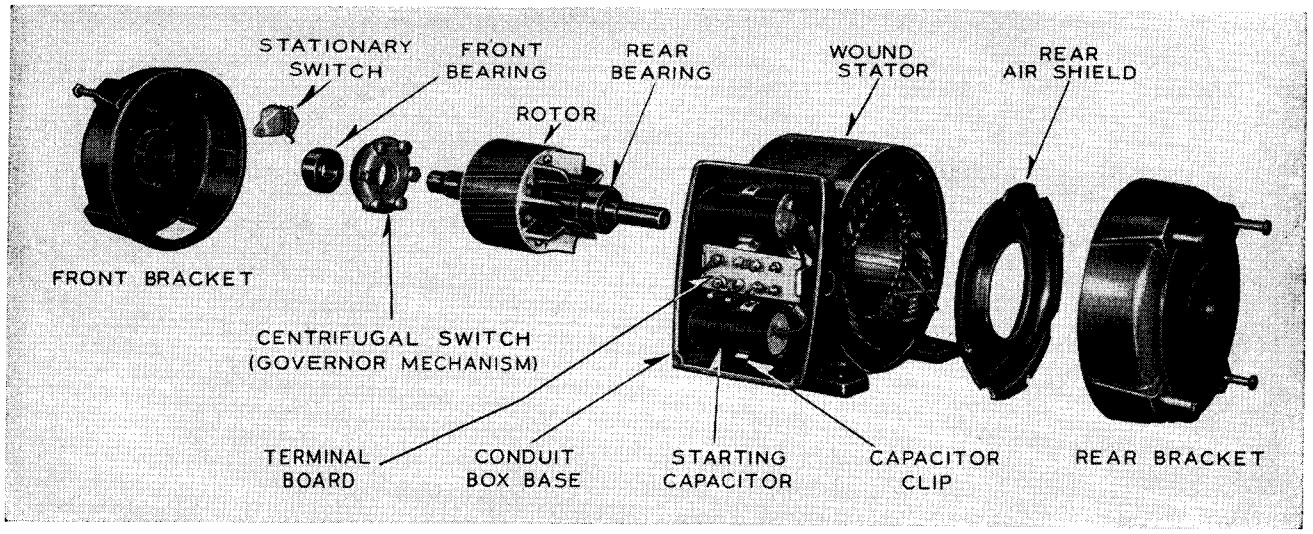

FIG. 2. Arrangement of Parts—Drip-proof Model AL Motor (Dual Voltage)

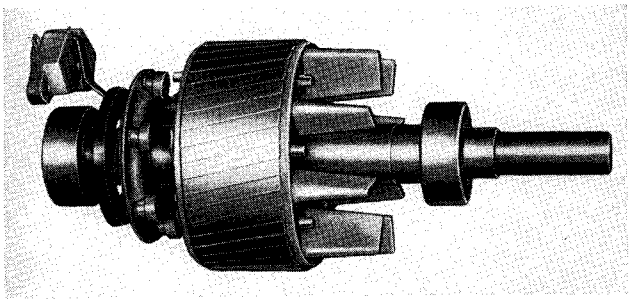

FIG. 3. Complete Rotor with Governor Mechanism of the Centrifugal Switch in Place and Contact Assembly in Relative Position

When removing the rotor be sure to support it so that the rotor or shaft extension does not rub on the stator windings and damage them.

Observe the number and location of any shims or springs present in the brackets.

When reassembling the motor, wipe all excessive grease, dirt, or foreign material out of the bracket bearing housing. Replace shims or springs exactly as found and reassemble. Turn the shaft by hand; if it turns freely the assembly is correct.

Capacitors. The Model AL motor is furnished with starting capacitors only, located in the conduit box. These capacitors are in insulated containers held in place in the conduit box by a clamp. Continuous, frequent starting or high ambient temperature may damage the starting capacitors. These capacitors are intermittently rated and permit 20 motor starts per hour when each start has a three second accelerating time.

The Model AM motor is furnished with starting and running capacitors located in the conduit box. The running capacitors may be identified by the metal cases as shown in Fig. 4, and are rated for continuous operation.

Centrifugal Switch. On those motors where the switching mechanism is a centrifugal switch, it functions to disconnect the starting capacitors when the motor has reached a predetermined speed. On the Model AL the starting winding is also disconnected. On the Model AM motor the running capacitor and winding remain in the circuit and function during the normal operation of the motor. Fig. 3 shows the complete rotor with the governor mechanism in place, with the contacts part of the switch in its relative position.

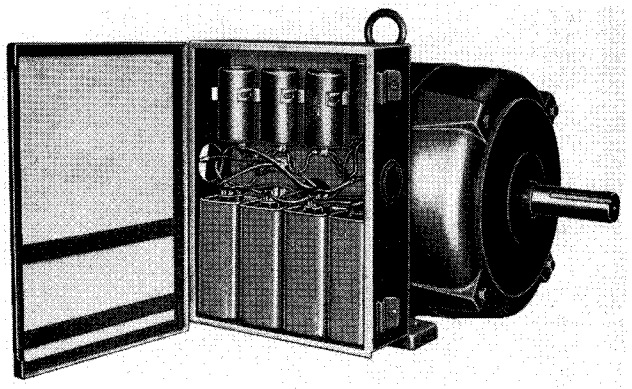

FIG. 4. Conduit Box Assembly, Model AM Motor

The centrifugal switch consists of two parts: contacts and governor mechanism. The contacts are stationary and are located in the front bracket. The governor mechanism is pressed on the shaft and rotates with it. When a predetermined speed is reached, the governor opens the contacts and disconnects the starting capacitors as previously described.

The governor mechanism has a definite location on the shaft, which is held to a close tolerance necessary for correct operation. If this part is ever replaced, the new one must be installed in the exact location of the old one. Care must be taken not to bend it. The contacts part can easily be replaced by soldering on two wires and attaching it to the bracket with two small screws. These parts are designed for long life and should rarely need to be replaced.

If a standard horizontal motor is to be mounted vertically with shaft extension down, a slight modification is necessary to insure optimum switch operation. This modification consists of moving the preloading spring which is a "wavy washer" normally located between the bearing and the rear bracket to a similar position between front bearing and front bracket. Also install two $\frac{3}{8}$" inside diameter washers $\frac{1}{16}$" thick under the stationary switch, between switch and mounting pads on bracket.

RENEWAL PARTS

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

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