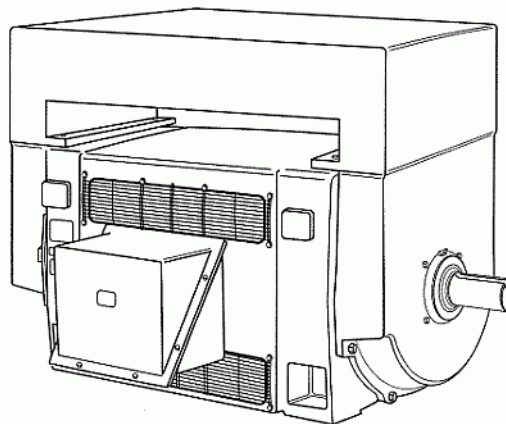
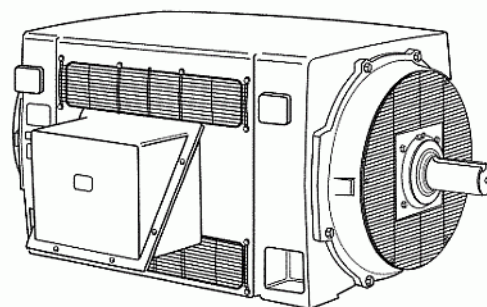
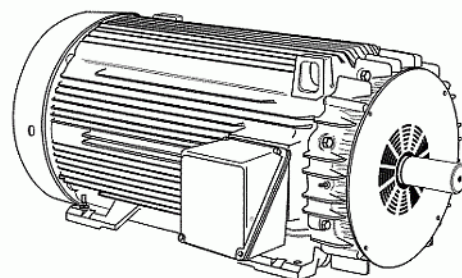
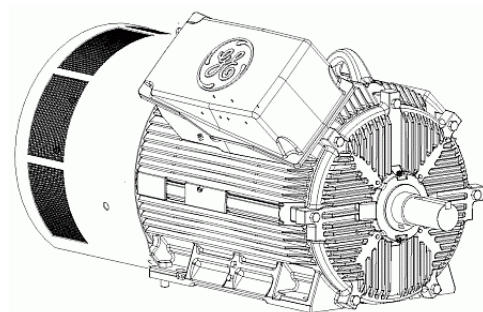




Instructions

500 Diameter Line Horizontal Induction Motors

**Quantum LMV 315/500 TEFC,
Totally Enclosed Fan Cooled,
Dripproof,
Weather Protected Type I and Type II,
and Explosion-Proof**



Safety Precautions



Warning

High voltage and rotating parts can cause serious or fatal injuries. Installation, operation, and maintenance of electric machinery should be performed by qualified personnel. Familiarization with NEMA Publication MG-2, Safety Standard for Construction and Guide for Selection, Installation and Use of Electric Motors and Generators, the National Electric Code, and sound local practices is recommended.

For equipment covered in this instruction book, it is important to observe safety precautions to protect personnel from possible injury. Among the many considerations, personnel should be instructed to:

- **Avoid contact with energized circuits or rotating parts.**
 - **Avoid by-passing or rendering inoperative any safeguards or protective devices.**
 - **Avoid use of automatic-reset thermal protection where unexpected starting of equipment might be hazardous to personnel.**
 - **Avoid contact with capacitors until safe discharge procedures have been followed.**
 - **Provide proper safeguards for personnel against possible failure of motor-mounted brake.**
 - **Do not change brushes with any power connected to the machine.**
 - **Be sure that the shaft key is fully captive before the motor is energized.**
- **Avoid extended exposure in close proximity to machinery with high noise levels.**
 - **Use proper care and procedures in handling, lifting, installing, operating, and maintaining the equipment.**
 - **If eyebolts are used for lifting motors, they must be securely tightened, and the direction of the lift must not exceed a 15° angle with the shank of the eyebolt. Do not use eyebolt in ambient below 0°F. At lower temperature, eyebolt could fail resulting in injury to personnel and/or damage to equipment. Drop-forged eyebolts per ASTM A489 or equivalent must be used.**
 - **Do not lift the motor and driven equipment with the motor lifting means.**

Safe maintenance practices with qualified personnel are imperative. Before starting maintenance procedures, be positive that:

- **Equipment connected to the shaft will not cause mechanical rotation.**
- **Main machine windings and all accessory devices associated with the work area are disconnected from electrical power sources.**

If a high-potential insulation test is required, procedure and precautions outlined in NEMA Standards MG-1 and MG-2 should be followed.

Failure to properly ground the frame of this machine can cause serious injury to personnel. Grounding should be in accordance with the National Electric Code and consistent with sound local practice.

These instructions do not purport to cover all of the details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.

Table of Contents

<u>Subject</u>	<u>Page</u>
Safety Warnings	2
I. General Information	4
A. How to Properly Use This Instruction Manual	4
B. Safety Symbol Legend	4
C. Safe Motor Operation	5
D. Description of Labels and Nameplates	6
E. Model and Serial Numbers	6
II. Receiving, Storage, Handling and Unpacking	6
A. Receiving	6
B. Storage	6
C. Handling	7
D. Unpacking	7
III. Installation	7
A. Location	7
B. Mounting	8
C. Alignment and Doweling	8
1. Direct Coupling	8
2. End-Play Adjustment	8
3. Belt Drive	9
4. Doweling and Bolting	9
D. Power Supply and Connections	9
1. Wiring and Grounding	9
2. Allowable Voltage and Frequency	9
3. Position of the Conduit Box	10
IV. Operation	10
A. Prior to Starting	10
B. Insulation Resistance	10
C. Steps Prior to Initial Start	10
D. Initial Start	11
E. Jogging and Repeat Starts	11
F. Heating	11
G. Motors for Hazardous Classified Locations	12
V. Maintenance	12
A. General	12
1. General Cleanliness	12
2. Inspection	12
B. Insulation and Windings	12
1. General	12
2. Vacuum and Compressed Air Cleaning	13
3. Cleaning with Water and Detergent	13
4. Cleaning with Solvents	13
5. Revarnishing Windings	13
C. Lubrication and Bearings	13
1. Anti-Friction Bearing Relubrication & Maintenance	13
2. Recommended Frequency of Regreasing	14
D. Anti-Friction Bearing Removal	15
1. Removal	15
2. Reassembly	16
E. Sleeve Bearing Maintenance	16
1. Lubrication	16
2. Oil	17
3. Cleaning Sleeve Bearing	17
4. Sleeve Bearing Replacement (Motors with Bearings Inside of Motor Endshields)	17
5. Sleeve Bearing Replacement (Quantum Motors with External Flange Mount Bearings)	18
F. Filters (WP11 Motors)	19
VI. Operational Difficulties	20
VII. Failure	28
VIII. Repair	28
IX. Renewal Parts	28

I. GENERAL INFORMATION

A. How to Properly Use This Instruction Manual

This manual has been written to assist the user with proper procedures when handling, installing, operating and maintaining the equipment. All of the safety warnings and instructions in this book must be followed to prevent injury to personnel.

The installation and maintenance manual must be kept for future reference during installation, operation and maintenance.

Below is a safety symbol table that identifies the safety symbols that will appear in this manual and on the equipment.

B. Safety Symbol Legend



The use of a lightning bolt within an arrowhead symbol, enclosed in a yellow triangle, indicates warning of dangerous electrical voltage that could cause an electric shock to a person.



This symbol identifies any terminal, which is intended for connection to an external grounding conductor for protection against electric shock in case of a fault.



The use of an exclamation point within a yellow triangle indicates to the user that important installation operating and maintenance instructions must be followed.



The use of a small case “i” enclosed in a square indicates a general note.



The use of wavy lines enclosed in a yellow triangle, indicates that the motor can be hot and should not be touched without taking proper precautions.

WARNING:

Indicates a procedure or condition that, if not strictly observed, could result in personal injuries or death.

CAUTION:

Indicates a procedure or condition that, if not strictly observed, could result in minor injuries to personnel.



This symbol instructs one to read the manufacturer’s instruction manual before installation, operation and maintenance.



This symbol represents the need to wear hearing protection.

C. Safe Motor Operation



WARNINGS: High voltage and rotating parts can cause serious or fatal injuries. Qualified personnel should perform installation, operation and maintenance of electrical machinery. For equipment covered by this instruction book, it is important to observe safety precautions to protect personnel from possible injury. Be sure to keep the installation and maintenance information for future reference. All warning and cautions must be followed.

Installation

- Avoid contact with energized circuits and rotating parts.
- Avoid bypassing or rendering inoperative any safeguards or protective devices.
- Avoid use of automatic-reset thermal protection where unexpected starting of equipment might be hazardous to personnel.
- Avoid long contact with capacitors until safe discharge procedures have been followed.
- Be sure the shaft key is captive before the motor is energized.
- Avoid long exposure in close proximity to machinery with high noise levels.
- Use proper care and procedures in handling, lifting, operating and maintaining the equipment.
- Use proper protective gear when handling, lifting, installing, operating and maintaining the equipment.
- If eyebolts are used for lifting motors, they must be securely tightened and the direction of the lift must not exceed a 15° angle with the shank of the eyebolt. Do not use eyebolts in an ambient below 0°F. At lower temperature, the eyebolt could fail resulting in injury to personnel and/or damage to equipment. Dropforged eyebolts per American Society of Testing Materials A489 or equivalent must be used.
- Do not use the shaft as a means for lifting.
- Do not lift both the motor and driven equipment with the motor lifting means.
- Do not stand on or place objects on the motor.

Maintenance

Safe maintenance practices performed by qualified personnel are imperative. Before starting maintenance procedures, be positive that:

- Equipment connected to the shaft will not cause mechanical rotation.
- Main motor windings and all accessory devices associated with the work area are disconnected from electrical power sources.
- The motor has been given time to cool.

Failure to properly ground the frame of the motor can cause serious injury to personnel. Grounding should be in accordance with IEC Standards and consistent with sound practice.

These instructions do not purport to cover all details in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes the matter should be referred to the General Electric Company.

This document contains proprietary information of General Electric Company, USA and is furnished to its customer solely to assist that customer in the installation, testing, operation and/or maintenance of the equipment described. This document shall not be reproduced in whole or in part, nor shall its contents be disclosed to any third party without the written approval of GE Industrial Systems.

D. Description of Labels and Nameplates

Motor ratings and identification data are furnished on labels and nameplates. Labels provide basic motor characteristics. Nameplates provide a permanent record of motor characteristics, plant identification and date of manufacture. Below is an example of a label that is attached to the shipping package.

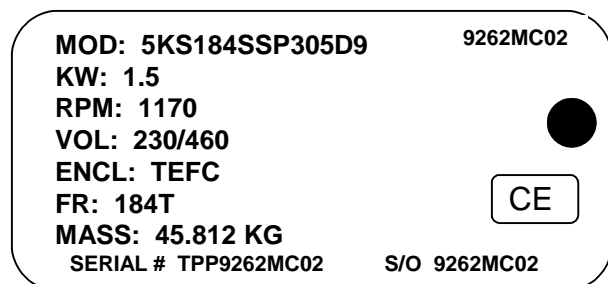


Figure 1 – Packing Label

MOD = GE model number
 KW = Motor power rating
 RPM = Motor speed at full load
 VOL = Motor voltage
 ENCL = GE enclosure code
 FR = NEMA frame size
 SERIAL = Motor serial number
 MASS = Motor mass

E. Model and Serial Numbers

As discussed in section D, every motor that is manufactured by GE Industrial Systems will be provided with a model and serial number, which is permanently marked on the motor nameplate and shipping pack. These numbers identify basic motor characteristics and pertinent data. When contacting a GE Industrial System service shop or representative, please refer to the model and serial number. In the note section of this book, space has been provided for you to record these numbers.

II. RECEIVING, STORAGE, HANDLING AND UNPACKING

A. Receiving

Each shipment should be carefully inspected upon arrival. Any damage should be reported promptly to the carrier and a claim filed. The nearest GE sales office may provide additional guidance.

B. Storage

In the event that the machine will not be put into service immediately, certain precautions should be taken to protect the machine while in storage. It is recommended that the machine be placed under cover in a clean, dry location.

During storage, windings should be protected from excessive moisture by some safe and reliable method of heating, such as space heaters, to keep the temperature of the windings a few degrees above the temperature of surrounding air. It is recommended that the machine in storage be inspected at periodic intervals, the windings meggered, and a log kept of pertinent data. (Refer to Operation section.) Any significant drop in insulation resistance should be investigated.

Precautions are taken by the factory to guard against corrosion. The machined parts are slushed to prevent rust during shipment. If the equipment is to be stored, examine the parts carefully for rust and moisture and re-slush where necessary. Machines with oil-lubricated bearings are normally operated and tested in the factory with a rust-inhibiting oil in the lubrication system, a rust-inhibiting film


remains on critical bearing surfaces during transit and for up to six months in storage. However, when the machine is received, it is recommended that the bearing oil reservoirs on sleeve-bearing machines be filled to the proper oil level with a good grade of rust-inhibiting oil. (Refer to Bearing Maintenance section.) Rotate the shaft of two-bearing machines (10 to 25 revolutions) until the journals are thoroughly coated with oil.


Grease-lubricated machines have the bearings greased at the factory with the cavity approximately 50% full.

Rotate the shaft of all two-bearing machines 10-20 revolutions at two month intervals.

If the purchaser has specified that the machine be packaged for long-term storage, the foregoing recommendations do not apply and the packages should be left intact during the period of storage.

C. Handling

 Warning	<p>Lifting lugs or eye-bolts on the motor are designed for handling the motor only. They are not to be used to lift the motor plus additional equipment such as pumps, compressors, or other driven equipment. In the case of assemblies on a common base, lugs or eyebolts provided on the motor are not to be used to lift the assembly and base, but, rather, the assembly should be lifted by a sling around the base or by other lifting means provided on the base. In the case of unbalanced loads (such as couplings or other attachments), additional slings, or other effective means should be used to prevent tipping. Failure to observe these precautions may result in damage to the equipment, injury to personnel, or both.</p>
---	---


 Caution	<p>Spreaders should be used in conjunction with the slings to prevent damage to the top section of weather-protected Type II motors while lifting the motor.</p>
---	---


D. Unpacking

If the machine or machine parts have been

exposed to low temperatures, unpack it only after it has reached the temperature of the room in which it will be unpacked or located; otherwise sweating will occur.

III. INSTALLATION

 Warning	<p>Installation should be in accordance with the National Electrical Code and consistent with sound local practices. Coupling, belt, and chain guards should be installed as needed to protect against accidental contact with moving parts. Machines accessible to personnel should be further guarded by screening, guard rails, etc., to prevent them from coming in contact with the equipment. Failure to observe these precautions may result in injury to personnel.</p>
---	--

 Warning	<p>If ignitable dust or lint is present the surface temperature of space heaters, if supplied, should not exceed 80% of the ignition temperature. Refer to space heater nameplate or factory for information on surface temperature. Dust and/or lint should not be allowed to build up around the surface of the space heaters. Failure to observe these precautions may result in damage to equipment, injury to personnel, or both.</p>
---	---


A. Location

Install the machine in a well-ventilated area. Make sure there is minimum clearance of one foot around the enclosure to allow normal flow of air.

Install dripproof motors in atmospheres which are reasonably free from dirt and moisture.

Weather-protected Type I motors may be installed in indoor locations with relatively high moisture content or sheltered outdoor locations in dry climates.

Weather-protected Type II motors may be installed outdoors. Use filters in environments with airborne dust and dirt.

	<p>Installation of the machine where hazardous, flammable, or combustible vapors or dusts present</p> <p>Warning</p> <p><i>a possibility of explosion or fire should be in accordance with the National Electrical Code, articles 500-503, and Consistent with sound local practices. Extreme care is required for machines supplied with an explosion-proof conduit box since any nicks or burrs in the sealing surfaces during disassembly and reassembly may destroy the explosion-proof or dust-ignition proof features. Failure to observe these precautions may result in damage to the equipment, injury to personnel, or both.</i></p>
---	---

B. Mounting

The foundation of the motor must be sufficiently rigid to minimize vibration and to maintain alignment between the motor and the driven equipment, or vibration and bearing wear will result. Foundation caps and sole plates, when used, are designed to act as spacers between the true foundation and the machine and must be evenly supported by the foundation. After accurate alignment of the driven and load-machine shafts, the base should be grouted to the foundation.

Oil-lubricated, sleeve-bearing machines should always be mounted with the shaft horizontal. The endshield should be located with the oil ring sight gage in the twelve o'clock position.

Machines equipped with anti-friction bearings may, under certain conditions, be mounted other than horizontal. Consult your GE representative before installing a machine in this manner, unless specifically ordered for other than horizontal mounting.

The standard transition and/or sliding bases are suitable for floor mounting. For other locations, check with the GE representative for recommendations.

C. Alignment and Doweling


1. Direct Coupling


Align motors accurately with the driven unit. For direct drive, use flexible couplings if possible. For drive recommendations, consult

drive or equipment manufacturers or GE.

Accurate mechanical lineup is essential for successful operation.

Mechanical vibration and roughness in running the motor may be indications of poor alignment. In general, lineup by straight edge across, and feeler gages between coupling halves is not sufficiently accurate. It is recommended that the lineup be checked with dial indicators and checking bars connected to the motor and load-machine shafts. The space between coupling hubs should be maintained as recommended by the coupling manufacturer. Shaft offset should not exceed .002". Angular misalignment should be less than .002".

	<p>Care should be exercised in installing and operating this equipment to prevent driven equipment such as pumps, compressors, hoists, etc., from driving the motor in the reverse direction and/or above rated speed.</p> <p>Caution</p>
---	---

	<p>Unless otherwise specified, the motor is designed to operate continuously only at rated speed, and in an emergency of short duration at the following overspeed:</p> <p>Warning</p>
Synchronous Speed RPM	Overspeed, Percent of Synchronous Speed
1801 and over	20
1800 and below	25
<p>Failure to observe these precautions may result in damage to the equipment, injury to personnel, or both.</p>	

2. End-play Adjustment

The axial position of the motor frame with respect to the load is important. The bearings furnished with these motors are not normally designed to take any external-thrust load unless specifically requested by the purchaser.

On sleeve-bearing machines the motor feet should be located at a correct distance from the load so that the motor rotor is in the

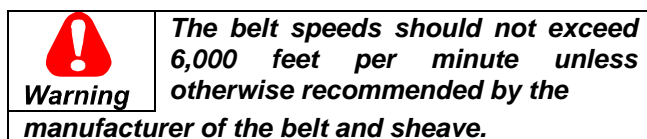
approximate mid-position of its end play. The mid-position of the rotor's end play may be determined by pushing the rotor shaft extension the maximum distance toward the stator and scribing the shaft with a pencil against a reference point on the bearing housing. Repeat this procedure with the shaft extension pulled the maximum distance away from the stator. The motor should be placed so that the rotor is in a position halfway between the scribe marks.

On some sleeve-bearing machines, a magnetic center mark is inscribed on the shaft at the shaft extension end of the motor. Locate this mark flush with the bearing housing.

3. Belt Drive

The applications of pulleys, sheaves, sprockets and gears on motor shafts is shown in NEMA MG1-14.07. For more information on allowable sheave sizes refer to the AC Motor Selection and Application Guide, GET-6812.

Align the sheaves carefully to avoid axial thrust on the bearings. Belt tension should just prevent slippage when the motor is running at full load. Excessive belt tensions cause unnecessary loads on the bearings. This may be especially true on high-inertia loads where belts may be tightened to prevent squealing and slipping during acceleration. On drives of this type, the belts should be allowed to slip during acceleration to prevent the possibility of overloading the motor bearings.



4. Doweling and Bolting

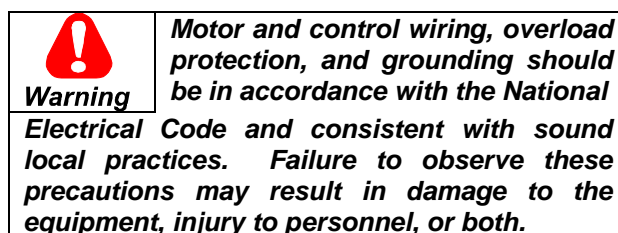
After alignment, dowel pins should be inserted through the motor base into the foundation to maintain the position of the motor if it becomes necessary to remove it. Dowel holes for this purpose are located in diagonally opposite feet. These holes should be drilled and reamed

together with corresponding holes in the foundation and the dowel pins inserted.

Mounting bolts must be carefully tightened to prevent changes in alignment and possible damage to the equipment. It is recommended that a washer be used under each nut or bolt head to get a secure hold on the motor feet; or, as an alternative, flanged nuts or bolts may be used. The recommended tightening torque (for medium carbon steel, SAE Grade 5 bolts, identified by three radial lines at 120° on the head) is 500 ft-lb minimum and 750 ft-lb maximum for 1" bolts, and 400 ft-lb minimum and 600 ft-lb maximum for 24mm bolts.

D. Power Supply and Connections

1. Wiring and Grounding



Stator winding connections should be made as shown on the connection diagram or in accordance with the wiring diagram attached to the inside of the conduit box cover.

The motor frame may be grounded by attaching a ground strap from a known ground point to the bronze grounding bolt in the conduit box or on motor frame.

2. Allowable Voltage and Frequency


The power supply must agree with the nameplate voltage and frequency. The motors will operate (but with characteristics somewhat different from nameplate values) on line voltages within $\pm 10\%$ of nameplate value and frequency within $\pm 5\%$, and a combined variation not to exceed $\pm 10\%$.

3. Position of the Conduit Box


When mounting conditions permit, the conduit box may be rotated so that entrance can be made upward, downward, or from either side. For oversize conduit boxes, such as those required for stress cones, or surge protection equipment, the mounting height of the motor may have to be increased for accessibility.

IV. OPERATION

A. Prior to Starting

	<i>If the motor has been stored in a damp location, dry it out thoroughly before operating. Before energizing the motor for the first time or after an extended shut down, it is advisable to check Insulation resistance, power supply and mechanical freedom of the motor.</i>
Warning	

B. Insulation Resistance

	<i>Before measuring insulation resistance, the machine must be at standstill and all windings to be tested must be electrically connected to the frame and to ground for a time sufficient to remove all residual electrostatic charge. Failure to observe these precautions may result in injury to personnel, damage to the equipment or both.</i>
Warning	

In accordance with established standards, the recommended minimum insulation resistance for the stator winding when measured with a 500 volt DC direct indicating ohmmeter with self-contained power supply (megger), is as follows:

$$R_s = \frac{V_s + 1}{1000}$$

Where R_s is the recommended minimum insulation resistance in megohms at 40°C of the entire stator winding obtained by applying direct potential to the entire winding for one minute, and V_s is rated machine voltage.

NOTE: See IEEE Recommended Practice for Testing Insulation Resistance of Rotating Machines, Publication No. 43, for more

complete information.


If the insulation resistance is lower than this value, it is advisable to eliminate the moisture in one of the following ways:

1. Dry the part in an air circulating oven with the air surrounding the part at 110°-15°C, +5°C until the part has been above 90°C for at least four hours. Then the air temperature may be raised to 150°C-15°C, +5°C. Continue to heat until the insulation resistance is constant for a one-half hour period.

2. Enclose the motor with canvas or similar covering, leaving a hole at the top for moisture to escape. Insert heating units or lamps and leave them on until the insulation resistance is constant for a one-half hour period.

3. With the rotor locked mechanically, and using approximately 10% of rated voltage, pass a current through the stator windings. Increase the current gradually until the winding temperature reaches 90°C. Do not exceed this temperature. Maintain a temperature of 90°C until the insulation resistance becomes constant for a one-half hour period.

C. Steps Prior to Initial Start

	<i>Be sure that the motor is not running and the power supply is disconnected.</i>
Warning	

1. For sleeve-bearing motors, flush out all sleeve bearings with kerosene to remove any dust or grit which may have accumulated during shipment and storage. Do not flush out anti-friction bearings. The bearing grease supplied is sufficient for initial operation.

Make sure that the oil plugs are tight and fill the oil wells with the oil recommended in the "Bearing Maintenance" section of this book to center of the oil level sight gages. (The oil level should be checked only when the machine is

not running.)

2. Whenever possible, examine the interior of the machine for loose objects or debris which may have accumulated and remove any foreign material.

3. If possible, turn the rotor by hand to be sure that it rotates freely.

4. Check all connections with the connection diagram. Check all accessible factory made connections for tightness to make sure none has become loose during shipment.

5. When the driven machine is likely to be damaged by the wrong direction of rotation, it is best to uncouple the drive from its load during the initial start and make certain that it rotates in the correct direction. If it is necessary to change rotation, interchange any two line leads. For multispeed motors check each speed independently.

Some machines are designed for unidirectional rotation. Rotation of these motors must be in accordance with the rotation indicated on the nameplate and the outline furnished with the equipment. Connection plates on the motor have been furnished to assist in obtaining the proper rotation.

D. Initial Start

1. After inspecting the machine carefully, make the initial start by following the regular sequence of starting operations in the control instructions.

2. For sleeve-bearing machines, after starting see that the oil rings are operating properly and that oil is being fed to the shaft.

The temperature of sleeve bearings, as measured by bearing temperature detector, should not exceed 100°C (212°F). If measured by thermometer at a point on the bearing housing nearest the bearing, the temperature should not exceed 60°C (140°F).

At initial start, the rate of rise of bearing temperature is more indicative of trouble than is total temperature. When starting a machine for the first time, the bearing temperature should be observed for a minimum of two hours. If at any time the rate of temperature rise exceeds 2°C/minute, shut down the machine immediately and make an investigation of lineup conditions, and if necessary, the bearing and oil ring assembly.


3. For anti-friction bearings check motor operation under load for an initial period of at least one hour to observe whether any unusual noise or hot spots develop.

4. In the event of excessive vibration or unusual noise, disconnect the machine from the load and check the mounting and alignment.

5. Space heaters should be de-energized during motor operation.

6. Check the operating current against the nameplate value. Do not exceed the value of nameplate amperes times service factor (if any) under steady continuous load.

E. Jogging and Repeat Starts

 Caution	<p><i>Repeated starts and/or jogs of induction motors greatly reduce the life of the winding insulation. The heat produced by each acceleration or jog is much more than dissipated by the motor under full load. If it is necessary to repeatedly start or jog a motor, it is advisable to check the application with the local GE sales office.</i></p>
---	--


F. Heating

Do not depend on the hand to determine temperature; use a thermometer. If there is any doubt about the safe operating temperature, take the temperature of the part in question and confer with the nearest GE sales office. Give full details, including all nameplate information.


Overheating of the machine may be caused by improper ventilation, excessive ambient temperature, dirty conditions, excessive current

due to overload or unbalance a-c voltage.

G. Motors for Hazardous Classified Locations

	<p>Machines supplied with an Underwriters' Laboratories (UL) Class I, Group C, D or Class II, Group E, F or G label have been designed and manufactured in accordance with standards established by UL for explosion-proof (Class I) and dust-ignition-proof (Class II) machines. Parts are machined to close tolerances, including conduit box covers. Extreme care must be taken during disassembly and reassembly, since any nicks or burrs may destroy the explosion-proof or dust-ignition-proof features of the machine. If these features are altered in any way the machine will no longer comply with the provisions of the UL inspection and label service manual and will no longer be properly classified as a UL labeled motor. The label should therefore be removed and the motor considered unsafe for use in hazardous classified locations.</p> <p>All service and repairs for UL labeled machines for hazardous classified locations must be performed at a UL certified service facility.</p> <p>Routine maintenance can be done locally, provided proper precautions are taken not to alter the original explosion-proof features. However, it should be emphasized that failure to observe these precautions may result in a machine which is unsafe for use in hazardous classified locations, and such use may result in a serious explosion causing property damage, personal injury, or both.</p>
---	--

V. MAINTENANCE

	<p>Before initiating maintenance procedures, disconnect all power sources to the machines and accessories. For machines equipped with surge capacitors do not handle capacitor until discharged by a conductor simultaneously touching all terminals and leads, including ground. This discharge conductor should be insulated for handling.</p> <p>Replace all normal grounding connections prior to operating.</p> <p>Failure to observe these precautions may result in injury to personnel.</p>
---	--

A. General

Inspect the motor at regular intervals, depending on service. Keep the motor cleaned and the ventilation openings clear.

In addition to the daily observation of the overall condition, it is recommended that a general inspection routine be set up to check periodically the following items:

General Cleanliness

Insulation and Windings

Lubrication and Bearings

1. General Cleanliness

The interior and exterior of the machine should be kept free from dirt, oil, and grease and conducting dust. Oily vapor, paper, or textile dusts may build up and block off ventilation. Any of these contaminants can lead to early motor failure.

2. Inspection


Direct drive sleeve-bearing motors have a two-piece endshield which aids accessibility. By removing the upper half of the endshield from both ends of the motor, the motor may be inspected without disturbing the line up.

B. Insulation and Windings

1. General


To obtain a long life and satisfactory operation of insulated windings, they should be kept clean from dirt, oil, metal particles, and other contaminants. A variety of satisfactory and acceptable methods are available for keeping equipment clean. The choice of method will depend greatly on time, availability of equipment, and on the insulation system. However, vacuum and/or compressed air cleaning with nonmetallic hose tips should proceed cleaning with water and detergent or with solvents. Tight adhering dirt will require


agitation by gentle brushing or wiping.

	Warning
To prevent injury to eyes and respiratory organs, safety glasses and suitable ventilation or other protective equipment should be used.	

2. Vacuum and Compressed Air Cleaning


Compressed air should be used to remove loose dirt and dust from air passages such as air ducts. Suction should be used to remove dirt and dust particles from windings to avoid driving particles into the windings and damaging the coils.

	Caution
Care must be taken to make sure that the air supply is dry and that excessive air pressure is not used. Generally a pressure of not more than 30 psi is recommended.	

	Warning
Operator must not use compressed air to remove dirt or dust from his person or clothing.	

3. Cleaning with Water and Detergent


This method is very effective in cleaning windings when used with a low-pressure steam jenny (maximum steam flow 30 psi and 90°C).

	Caution
To minimize possible damage to varnish and insulation, a fairly neutral non-conducting type of detergent, such as Dubious Flow, should be used. A pint of detergent to 20 gallons of water is recommended	

If a steam jenny is not available, the cleaning solution may be applied with warm water by a spray gun. After the cleaning operation, the windings should be rinsed with water or low pressure steam.


It is advisable to dry the windings. Refer to Insulation Resistance section for instructions on how to proceed.

4. Cleaning with Solvents

	Warning
Many cleaning fluids are flammable and/or toxic. To prevent injury to personnel and property, care should be taken to avoid flames, sparks, etc. Safety glasses should be used and contact with the skin should be avoided. The area should be well ventilated or protective equipment should be used.	

Although cleaning with water and detergent is the preferred method, solvent cleaning may be used when heat drying facilities are not available

Mineral spirits are recommended for use as the cleaning solvent. Solvent cleaning of silicone-insulated windings (Class H insulated machine), leads, and space heaters is not recommended.

	Warning
Mineral spirits should be used only in a well-ventilated area that is free from open flames. Avoid prolonged exposure to vapor. Failure to observe these precautions may result in injury to personnel.	

Windings cleaned with solvent should be dried thoroughly by circulation of dry air before voltage is applied.

5. Revarnishing Windings

After several cleanings with water and detergent, it may be necessary to revarnish the windings. This varnish is available from the General Electric Company Insulating Materials Department or a GE Authorized Service Shop

C. Lubrication and Bearings

1. Anti-Friction Bearing Relubrication and Maintenance

The grease used as a lubricant in grease-lubricated anti-friction ball bearings does not lose its lubricating ability suddenly, but over a period of time. For a given bearing construction and assembly, the lubricating ability of a grease with age depends primarily on the type of grease, the size of the bearing, the speed at which the bearing operates, and the

severity of operating conditions. As a result, it is not possible to accurately predetermine when new grease must be added. But, good results can be obtained if the general recommendations as stated in this instruction book are followed.


The primary function of grease is to supply the essential lubricating oil from the sponge-like reservoir of its soap structure. Grease-lubricated anti-friction ball bearings consume only a small amount of lubricant. This lubricant must always be present to avoid rapid wear and bearing failure. However, excessive or too frequent lubrication may damage the motor.

Ball bearing motors are adequately lubricated at the factory. Motors with grease fittings should be relubricated in accordance with these instructions to provide maximum bearing life.

To obtain optimum results, Exxon/Mobil, Polyrex EM (General Electric Specification D6A2C23) polyurea grease should be used for relubrication, unless a special grease is specified on the motor nameplate. Regreasing frequency should be in accordance with the following table. If in doubt, refer to GE. The procedure below must be followed for safe and effective regreasing.

2. Recommended Frequency of Regreasing

Recommended Regreasing Procedure:

	<i>Relubrication should be performed with the motor stationary and disconnected from the power source. Extreme caution must be exercised to avoid contact with rotating parts or electrical wiring if the motor must be relubricated while running. Failure to observe these precautions may result in damage to the equipment, injury to personnel, or both.</i>
---	--

- a. Run the motor until warm.
- b. Stop the motor and disconnect it from the power supply.

- c. Clean dirt and debris from around the inlet lubrication fitting and the grease relief plug.

- d. Remove the relief plug and clear the opening and relief tube of hardened grease. This may be accomplished with a twisted wire brush or sturdy pipe cleaner.

- e. Insert brush into relief hole. While the motor is still warm, add grease with a hand-operated grease gun until fresh grease appears on the end of the brush or until grease has been added up to the amount listed in below:

Bearing Size on Motor Nameplate	Number of Grease Gun Pumps	
	16 oz. Gun	24 oz. Gun
6315	65	45
6318	75	50
6320, NU320	95	65

NOTE: A standard 10,000 psi, 16 ounce grease gun delivers approximately 0.04 oz. of grease with each pump, and a 24 ounce gun delivers approximately 0.06 oz. of grease.


The number of pumps listed represents approximately 20% of the total grease cavity volume in the endshield.


- f. Leave the relief plug temporarily off. Start the motor and run for 10 to 20 minutes to expel any excess grease.

- g. Stop the motor. Replace the relief plug.


- h. Restart the motor, and resume operation.

Recommended Frequency of Regreasing			
Type of Service	Typical Examples	HP Range	Lubrication Interval (Years)
			Horizontal Mount
Easy	Valves, door openers, portable floor sanders, motor operating infrequently (one hour per day)	50 – 100	4
		200 – 350	3
		400 – 1000	1
Standard	Machine tools, air conditioning apparatus, conveyors (one or two shifts), garage compressors, refrigeration machinery, oil well pumps, water pumps, wood working machinery	50 – 100	1.5
		200 – 350	1
		400 – 1000	6 mo.
Severe	Motor for fans, machine tools, M-G sets, etc. (that run 24 hours a day, 365 days a year), coal and mining machinery, motors subject to severe vibration, steel mill machinery	50 – 100	9 mo.
		200 – 350	6 mo.
		400 – 1000	3 mo.
Very Severe	Dirty, vibrating applications, where end of shaft is hot (pumps and fans), high ambient temperature	50 – 100	4 mo.
		200 – 350	3 mo.
		400 – 1000	2 mo.


	Failure to observe the foregoing instructions for regreasing may result in grease leakage and/or bearing damage. To avoid damage to equipment, bearings and grease must be kept free of dirt.
Caution	

	Care must be taken to avoid scratching or nicking the critical surfaces of the balls or rollers.
Caution	

Since this method of greasing anti-friction bearings tends to purge the housing of used grease over a period of time, removal of all grease should be required infrequently. A GE authorized Service Shop can clean the bearing cavity and replace the bearings and grease when the motor is removed from service for maintenance or reconditioning.

	Extreme care is required in the disassembly of a machine for bearing removal. In addition, the surfaces of the shaft bearing fit and the bearing itself, must be protected during and after disassembly operations
Caution	

Anti-friction bearings may be removed from motors by the following procedures:

	Warranty may be voided if internal maintenance or repairs are not performed by an GE authorized service shop.
Warning	

a. Remove the four hex head bearing cap screws, adjacent to the motor hub, which hold the inner bearing cap.

D. Anti-Friction Bearing Maintenance

1. Removal

Even though high-quality design and workmanship are incorporated in a bearing, it sometimes becomes necessary to remove the bearing for maintenance. It is for this reason that the following instructions are included.

b. Remove the seven or eight hex head bolts on the outer flange of the endshield, which hold the endshield on the frame.

c. Remove the endshields.

d. If it is desirable to reuse the bearing, apply bearing puller to the inner rings only.

Opposite drive end (drive end with external fan) anti-friction bearings may be removed from these motors by the following procedures:

- a. Remove bolts securing fan casing.
- b. Remove set screws that secure the fan to the shaft extension or the retaining bolt at the end of the shaft.
- c. Remove the fan from the shaft extension. A gear puller can be used if necessary.
- d. Proceed with disassembly steps outlined under "Drive End Anti-Friction Bearing Removal".

Anti-friction bearings may be removed from WPII motors by the above procedure except that the top cover should be removed prior to removing any bolts from the endshield. Two 1/2-13 tapped holes located in the top center of the top cover are recommended for lifting the cover. Remove the eight hex head bolts per step 2, except that access to the four upper endshield bolts is gained through the air inlet chute. Proceed with step 3.

2. Reassembly

Cleanliness is important when working with bearings. Before reassembling a bearing, all bearing and machined surfaces should be thoroughly cleaned with suitable solvent. Examine the machined fits of the endshield, cartridge, slinger, and grease cap for burrs. It is important that these surfaces be smooth.

Reassembly of the bearing should be performed in the following manner:

- a. Inspect the bearing housing and related parts for foreign material. Clean if necessary.
- b. The machined fits and critical surfaces of the endshield, bearing housing, bearing cap and bearings should be free of all

nicks, scratches or burrs. If any polishing is done, care should be taken to avoid a deposit of metal dust in and around the bearing assembly.

- c. The internal surface of the bearing housing should be coated with a thin film of the recommended grease. The shaft and the shaft fit of the grease housing and grease cap should also receive a very light coating of the recommended grease. These precautions, although not absolutely essential, will guard against corrosion of the critical surfaces.

- d. Heat the bearing in oil or with an inductive heater to a temperature between 80°C and 125°C (176°F to 257°F) and place it on the shaft. Hold it against the shaft shoulder until the bearing cools.

- e. For the usual case, place the spring washer between the opposite drive end bearing and the endshield.

- f. Procure a stud, 8" long, threaded on one end (3/8-16 thread). Screw the stud into one of the holes in the inner bearing-cap through one of the holes in the endshield.

- g. All subsequent reassembly steps will be a reversal of the disassembly procedure.

E. Sleeve Bearing Maintenance (All Sleeve Bearing Motors)

1. Lubrication

Prior to operation of the motor, both oil reservoirs should be filled to the center of the oil level gage. The oil should be maintained at this level (determined with the motor at stand still) during operation of the motor. Oil is added through the oil ring sight gage hole above each bearing or through the inlet pipe provided.

2. Oil

For average indoor temperatures, use a good grade of mineral oil having an average viscosity of 150 seconds Saybolt at 100°F. For temperatures higher than the average indoor temperatures and for slow-speed motors (less than 1500 rpm), a heavier oil with an average viscosity of 300 seconds Saybolt at 100°F should be used. The oil should be a high-quality oil containing oxidation and corrosion inhibitors. For motors operating in areas where near freezing temperatures may occur, an oil with a sufficiently low pour point should be used. The above oil corresponds to oil per GE Specification No. D6B14.


Consult GE regarding special lubricants for unusual operating conditions.


3. Cleaning Sleeve Bearing

Sleeve-bearing housings are provided with liberal settling chambers into which dust, dirt, and oil sludge collect. The only cleaning necessary is to remove the drain plug from beneath the oil level indicator or bearing housing as the case may be. After draining, seal the threads of the drain plug with an oil sealing compound and refill the oil reservoir.

Whenever the motor is disassembled for general cleaning, the bearing housing may be washed out with a suitable solvent. In washing the bearing housing the bearing and endshield assembly should be disassembled only to the extent that is absolutely necessary. Dry the bearing lining and cover the shaft with a film of oil before reassembling.

4. Sleeve Bearing Replacement (Motors Equipped with Sleeve Bearings Inside of Motor Endshields)

	<i>Extreme care is required in the disassembly of a bearing to prevent nicking or burring of the bearing or machined surfaces. In addition, the surfaces of the journal and the bearing must be protected from damage when exposed during the process of disassembly.</i>
Caution	

	<i>Remove all bearing sensors prior to disassembly of the bearing.</i>
Caution	

a. The drive end sleeve bearing may be replaced on dripproof and WPI motors by the following procedure:

(1) Remove the four bolts on the outer flange of the upper half of the endshield which secure it to the frame.

(2) Remove the two bolts which hold the upper half and lower half of the endshields together. If a single screen covers the upper half and lower half of the endshield, remove it.

(3) Remove the upper half of the endshield.

(4) Remove the four bolts which hold the bearing cap to the lower half of the endshield.

(5) Remove the upper half of the bearing cap and the bearing.


(6) Jack or sling up the shaft a few mils to remove the weight of the rotor from the lower half of the bearing surface.

(7) Rotate the lower half of the bearing around the shaft journal 180° and remove it. Be careful not to damage the bearing surface or the oil ring if they are to be reused.

(8) The lower half of the endshield may be removed from the frame after the four bolts on the outer flange of the

endshield are removed. (If desired, a split oil ring may be obtained from Renewal Parts.)

b. For WPII motors, remove the four bolts holding the top cover of the upper half of the endshield. Remove the top cover. Two 1/2-13 tapped holes located in the top center of the top cover are recommended for lifting the top cover.

 <p>Caution</p>	<p><i>If eyebolts are used for lifting the top cover, they must be securely tightened, and the direction of lift must not exceed a 15° angle with the shank of the eye-bolt. Do not use the eyebolt in an ambient below 0°F. At a lower temperature the eyebolt could fail. Drop forged eyebolts per ASTM A489 or equivalent must be used.</i></p>
---	---

Remove the four internal bolts which hold the upper half of the endshield to the frame and the four bolts which hold the upper half of the endshield to the lower half of the endshield. Access to these bolts may be gained through the air chute of the upper endshield. Remove the two external bolts holding the upper to the lower endshield. Remove the upper half of the bearing. Proceed with step 6 above.

c. The drive end sleeve bearing on TEFC motor (with no external fan) may be replaced by the following procedure:

(1) Drain the oil from the reservoir and remove the oil piping which extends through the fan housing

(2) Remove the eight hex head bolts on the outer flange of the endshield, which hold the endshield to the frame.

(3) Remove the endshields.

The opposite drive end sleeve bearing may be replaced on these motors by the following procedure:

(1) Drain the oil from the reservoir and remove the oil piping which extends through the fan housing.

(2) Remove the bolts securing the fan guard to the fan casing.

(3) Remove the bolts holding the fan casing to the endshield.

(4) Loosen the set screw that secures the fan to the shaft extension.

(5) Remove the fan from the shaft extension by employing a gear puller.

(6) Proceed with disassembly steps outlined under “Drive-End Sleeve-Bearing Disassembly.”

d. Cleanliness is important when working with bearings. Before reassembling a bearing, all bearing and machine surfaces should be thoroughly cleaned with a suitable solvent. Examine all machined fits for burrs. Remove all oil compound from sealing surfaces.

Prior to actual reassembly, the following precautions should be observed:

(1) Inspect the bearing housing and related parts for foreign matter. Clean, if necessary.


(2) Inspect the journals and polish them with crocus cloth if any scratches are detected. Do not allow any metal dust to fall into the housing when polishing the journals.


(3) Spread a thin coat of oil over the journal and bearing surfaces before reassembling.

(4) The sealing surfaces of the endshield should be coated with a sealing compound such as No. 3 Permatex.

(5) The reassembly of the bearing is essentially a reversal of the disassembly procedure.

5. Sleeve Bearing Replacement (Quantum Motors: Supplied With External Flange Mounted Bearings)

	Extreme care is required in the disassembly of a bearing to prevent nicking or burring of the bearing or machined surfaces. In addition, the surfaces of the journal and the bearing must be protected from damage when exposed during the process of disassembly.
Caution	

	Remove all bearing sensors prior to disassembly of the bearing.
Caution	

a. The drive end sleeve bearing may be replaced by the following procedure:

(1) Remove the three socket head cap screws on the outer flange of the upper half of the bearing housing which secure it to the endshield.

(2) Remove the four socket head screws that secure the top half of the bearing housing to the bottom half.

(3) Remove the upper half of the bearing housing.

(4) Remove the four socket head screws on the bearing.

(5) Remove the upper half of the bearing.

(6) Jack up the shaft a few mils to remove the weight of the rotor from the lower bearing surface.

(7) Remove the split line screws from the oil ring and remove the split parts.

(8) Rotate the lower half bearing around the shaft and remove.

b. Cleanliness is important when working with bearings. Before reassembling a bearing, all bearing and machine surfaces

should be thoroughly cleaned with a suitable solvent. Examine all machined fits for burrs. Remove all oil sealing compound from sealing surfaces.

Prior to actual reassembly, the following precautions should be observed:

(1) Inspect the bearing housing and related parts for foreign matter. Clean, if necessary.

(2) Inspect the journals and polish them with crocus cloth if any scratches are detected. Do not allow any metal dust to fall into the housing when polishing the journals.

(3) Spread a thin coat of oil over the journal and bearing surfaces before reassembling.

(4) The sealing surfaces of the bearing should be coated with a sealing compound such as No. 3 Permatex.

(5) To replace the bearing, reverse the disassembly procedure.

F. Filters (WP11 Motors)

If the motor is supplied with filters in the top section, it is recommended that they be cleaned periodically following the filter manufacturers recommendations as to the cleaning interval.

To remove the filter, remove the eight screws holding the cover plate to the top adapter at each side of the top cover. Remove the filter.

If the motor is supplied with filters in the top section, it is recommended that they be cleaned periodically following the filter manufacturers recommendations as to the cleaning interval.

To remove the filter, remove the eight screws holding the cover plate to the top adapter at each side of the top cover. Remove the filter.

VI. OPERATIONAL DIFFICULTIES

Some operating difficulties may occur, and their causes are given in the following chart and should be corrected as soon as possible.

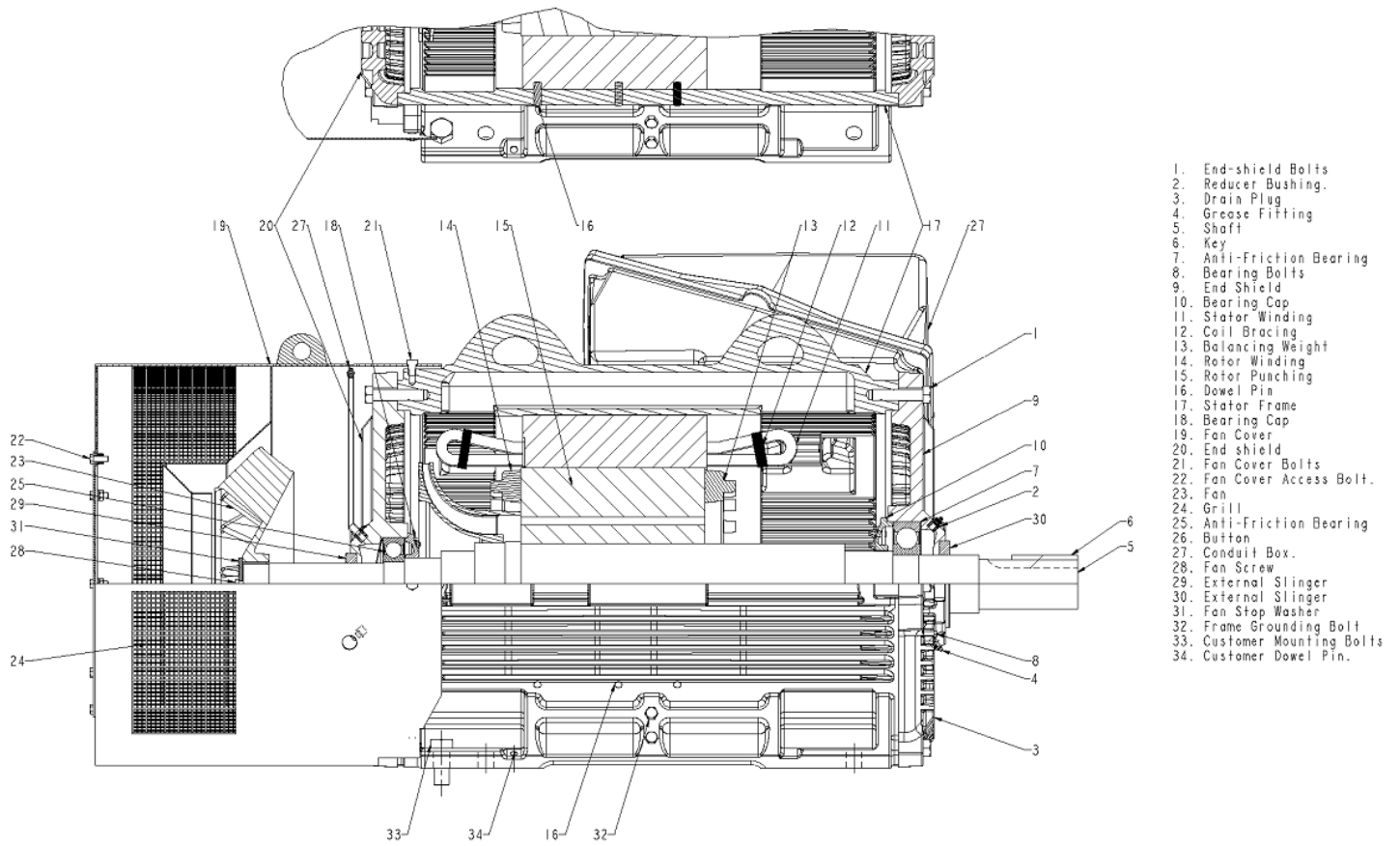
TROUBLE SHOOTING CHART

Affected Parts	Difficulty	What to Check
Windings	Overheating	<ul style="list-style-type: none"> • Calibration of measuring instrument • Excessive Current • Unbalanced AC current • Improper or restricted ventilation • Excessive ambient temperature • Short circuited coil or windings • Dirty windings • Unbalanced voltage
Bearings	Overheating	<ul style="list-style-type: none"> • Calibration of measuring instrument • Worn out or dirty oil * • Rough journal* • Oil rings jammed* • Insufficient Oil* • Misalignment • Excessive end thrust or radial loading • Shaft currents • Excessive or insufficient grease** • Worn out or dirty grease**
Bearing Housing	Oil Leaks	<ul style="list-style-type: none"> • Sealing compound omitted from housing surfaces • Incorrect grade of oil • Drain back restricted
Motor	Excessive Vibration	<ul style="list-style-type: none"> • Unbalance • Misalignment • Improper or settled foundation • Non-uniform air gap • Rubbing parts • Bent shaft • Unbalanced stator current • Damaged bearing
Insulation	Low insulation resistance or insulation failure	<ul style="list-style-type: none"> • Moisture, dirt, metal particles, oil, or other contaminants on the insulated windings • Wrong voltage • Excessive Temperature • Voltage surges • Mechanical damage • Excessive vibration with resultant mechanical damage

* Sleeve bearings

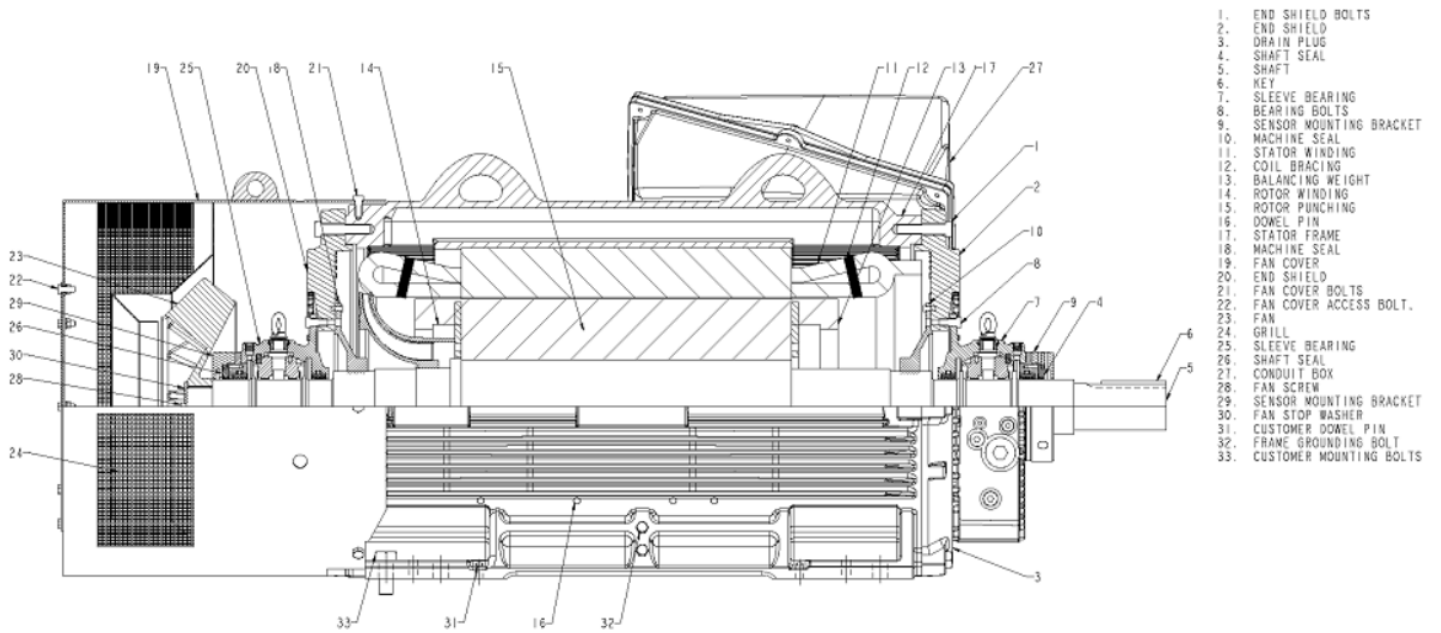
** Anti-friction bearings

Quantum 315/500 TEFC - Ball Bearing

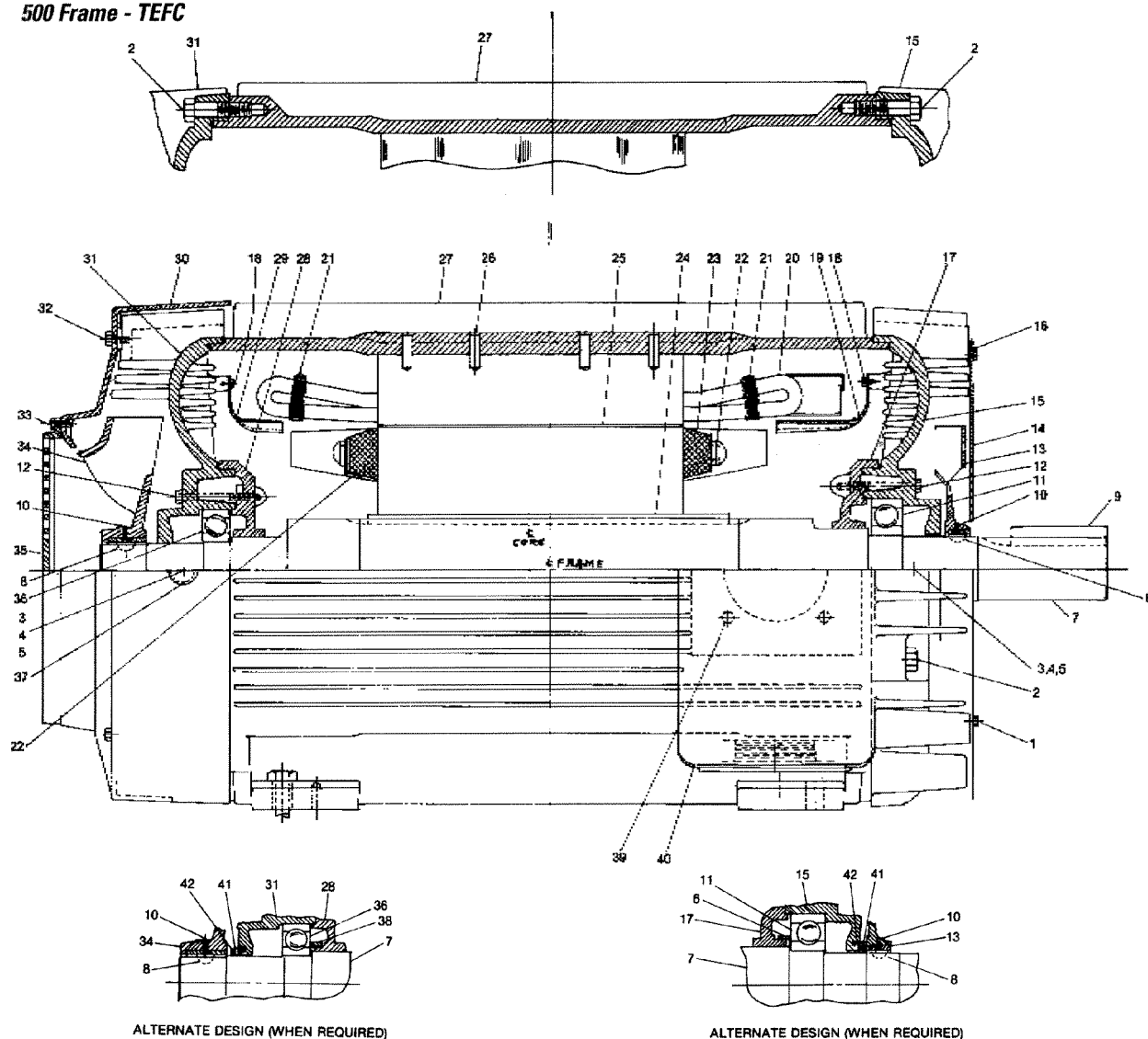


1. End-shield Bolts
2. Reducer Bushing.
3. Drain Plug
4. Grease Fitting
5. Shaft
6. Key
7. Anti-Friction Bearing
8. Bearing Bolts
9. End Shield
10. Bearing Cap
11. Stator Winding
12. Coil Bracing
13. Balancing Weight
14. Rotor Winding
15. Rotor Punching
16. Dowel Pin
17. Stator Frame
18. Bearing Cap
19. Fan Cover
20. End shield
21. Fan Cover Bolts
22. Fan Cover Access Bolt.
23. Fan
24. Grill
25. Anti-Friction Bearing
26. Button
27. Conduit Box.
28. Fan Screw
29. External Slinger
30. External Slinger
31. Fan Stop Washer
32. Frame Grounding Bolt
33. Customer Mounting Bolts
34. Customer Dowel Pin.

Quantum 315/500 TEFC - Sleeve Bearing

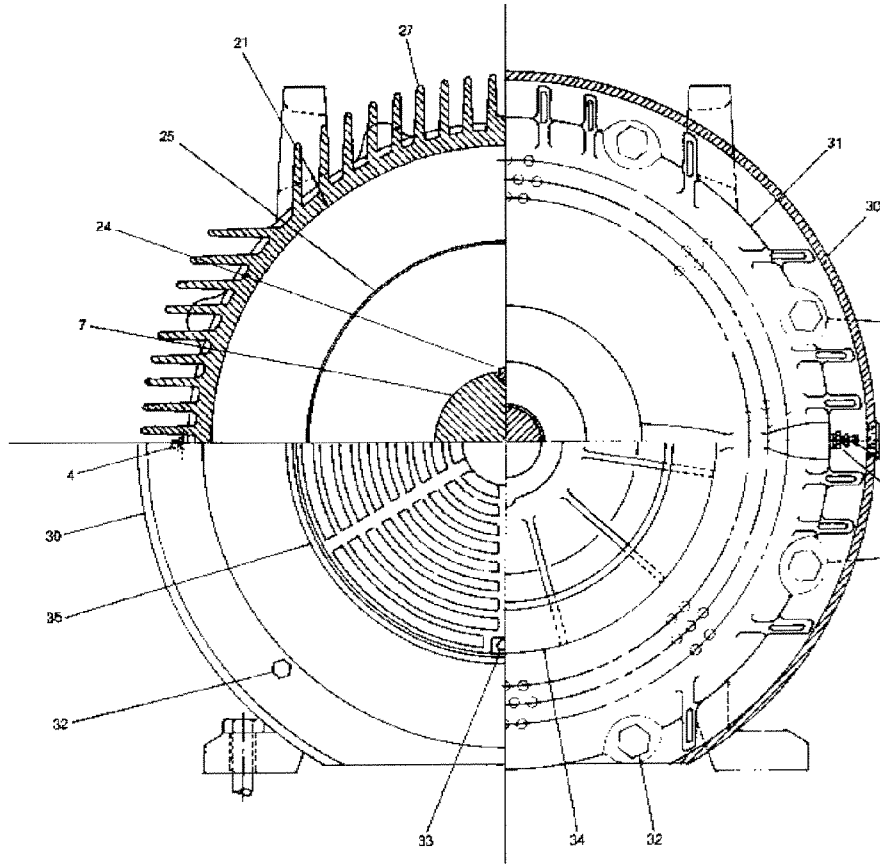


500 Frame - TEFC

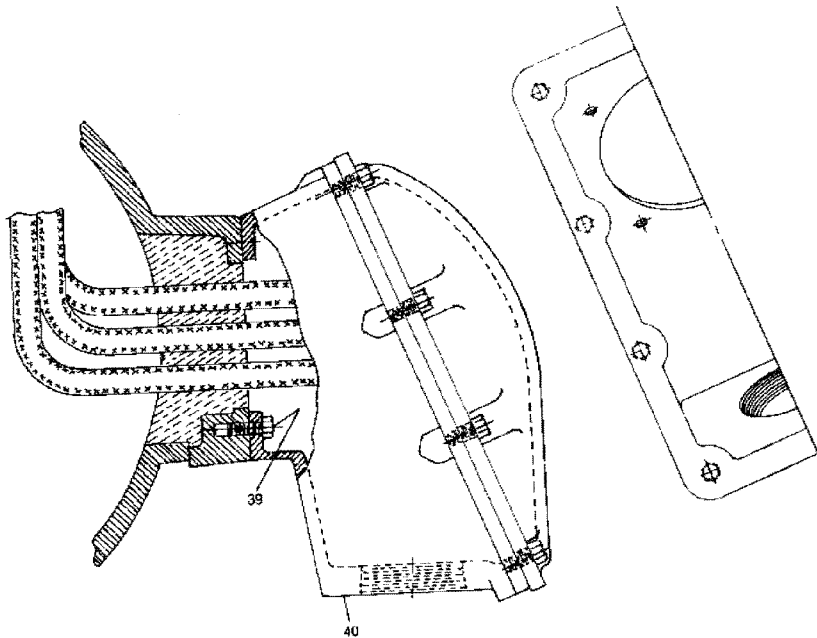


- | | | |
|--------------------------|--------------------------|-------------------------------------|
| 1 Guard-fan bolts | 16 Washer | 31 End shield |
| 2 End-shield bolts | 17 Bearing cap | 32 Fan casing-bolts |
| 3 Reducer bushing | 18 Air deflector bolt | 33 Grill-bolts |
| 4 Drain plug | 19 Air deflector | 34 Front end-fan |
| 5 Grease fitting | 20 Stator winding | 35 Grill |
| 6 Inner slinger | 21 Coil bracing | 36 Anti-friction bearing |
| 7 Shaft | 22 Balance weights | 37 Button |
| 8 Fan-key | 23 Rotor winding and fan | 38 Inner slinger |
| 9 Key | 24 Rotor key | 39 Conduit box-bolts |
| 10 Fan-set screw | 25 Rotor punching | 40 Conduit box |
| 11 Anti-friction bearing | 26 Dowel pin | 41 Set screw |
| 12 Bearing cap bolts | 27 Stator frame | 42 External slinger (when required) |
| 13 Drive end-fan | 28 Bearing cap | 43 External slinger (when required) |
| 14 Guard-fan | 29 Air deflector | |
| 15 End shield | 30 Fan casing | |

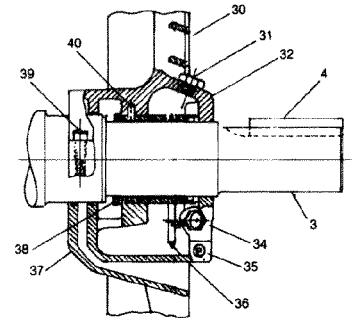
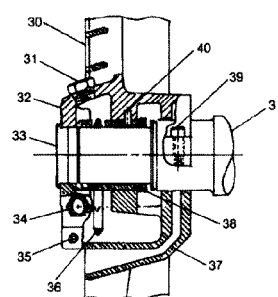
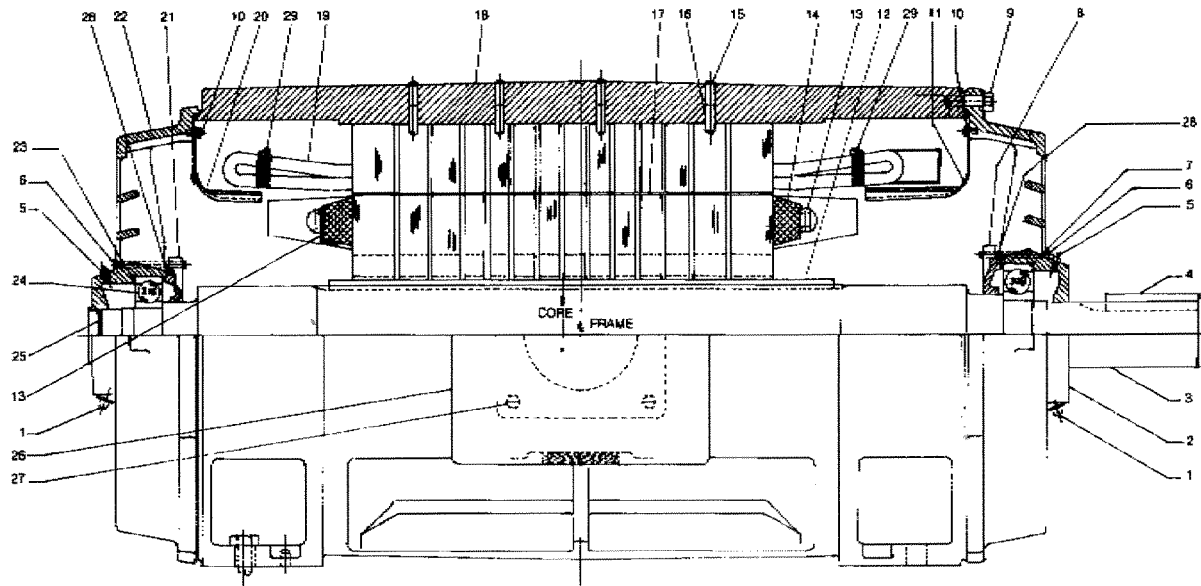
500 Frame - TEFC, Explosion Proof, End View and Conduit Box



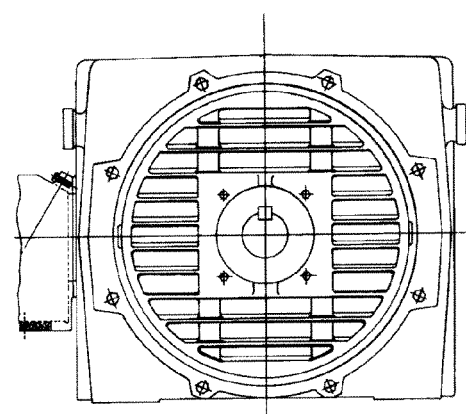
- 1 Guard-fan bolts
- 2 End-shield bolts
- 3 Reducer bushing
- 4 Drain plug
- 5 Grease fitting
- 6 Inner slinger
- 7 Shaft
- 8 Fan-key
- 9 Key
- 10 Fan-set screw
- 11 Anti-friction bearing
- 12 Bearing cap bolts
- 13 Drive end-fan
- 14 Guard-fan
- 15 End shield
- 16 Washer
- 17 Bearing cap
- 18 Air deflector bolt
- 19 Air deflector
- 20 Stator winding
- 21 Coil bracing
- 22 Balance weights
- 23 Rotor winding and fan
- 24 Rotor key
- 25 Rotor punching
- 26 Dowel pin
- 27 Stator frame
- 28 Bearing cap
- 29 Air deflector
- 30 Fan casing
- 31 End shield
- 32 Fan casing-bolts
- 33 Grill-bolts
- 34 Front end-fan
- 35 Grill
- 36 Anti-friction bearing
- 37 Button
- 38 Inner slinger
- 39 Conduit box-bolts
- 40 Conduit box
- 41 Set screw
- 42 External slinger (when required)
- 43 External slinger (when required)



500 Frame - Dripproof

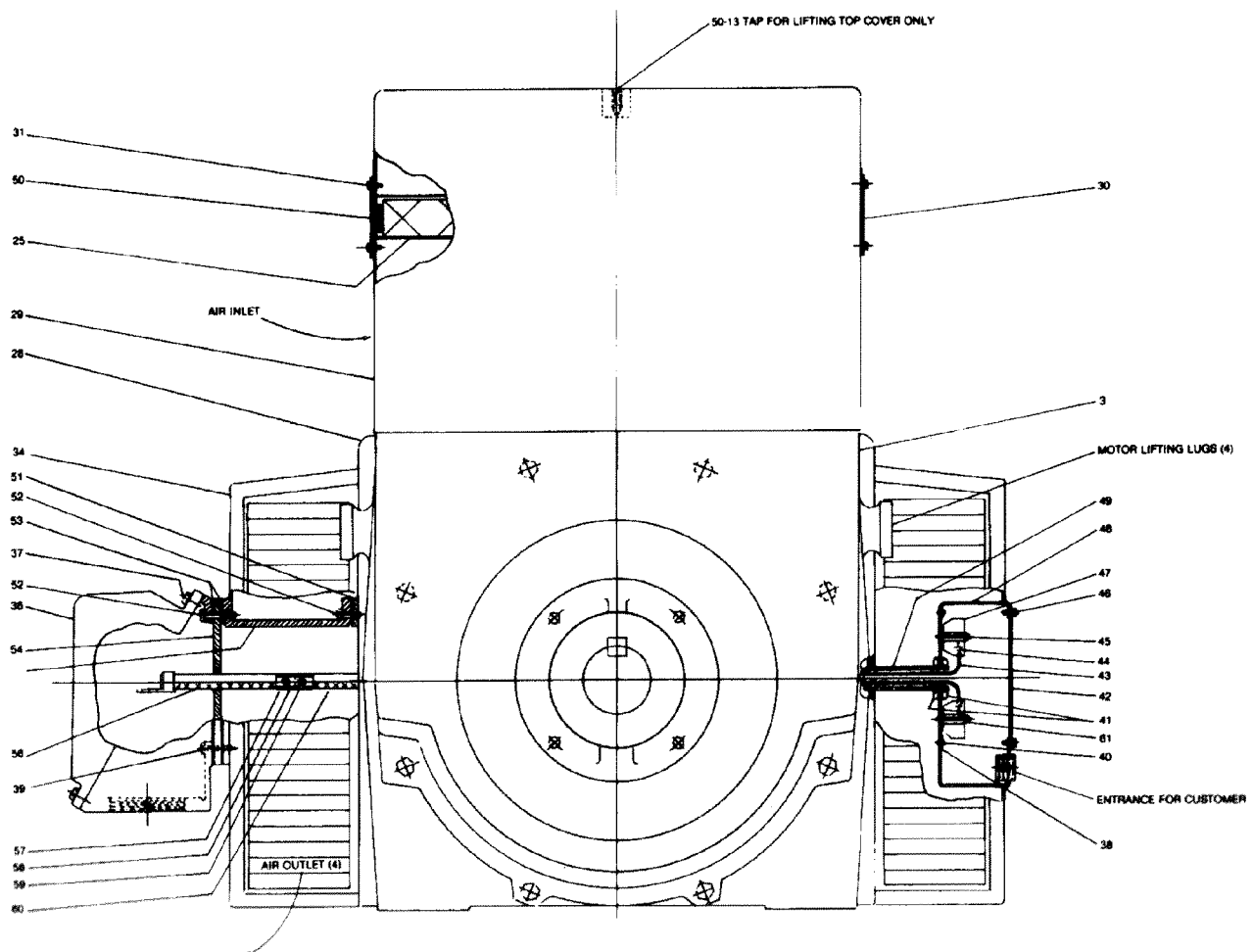


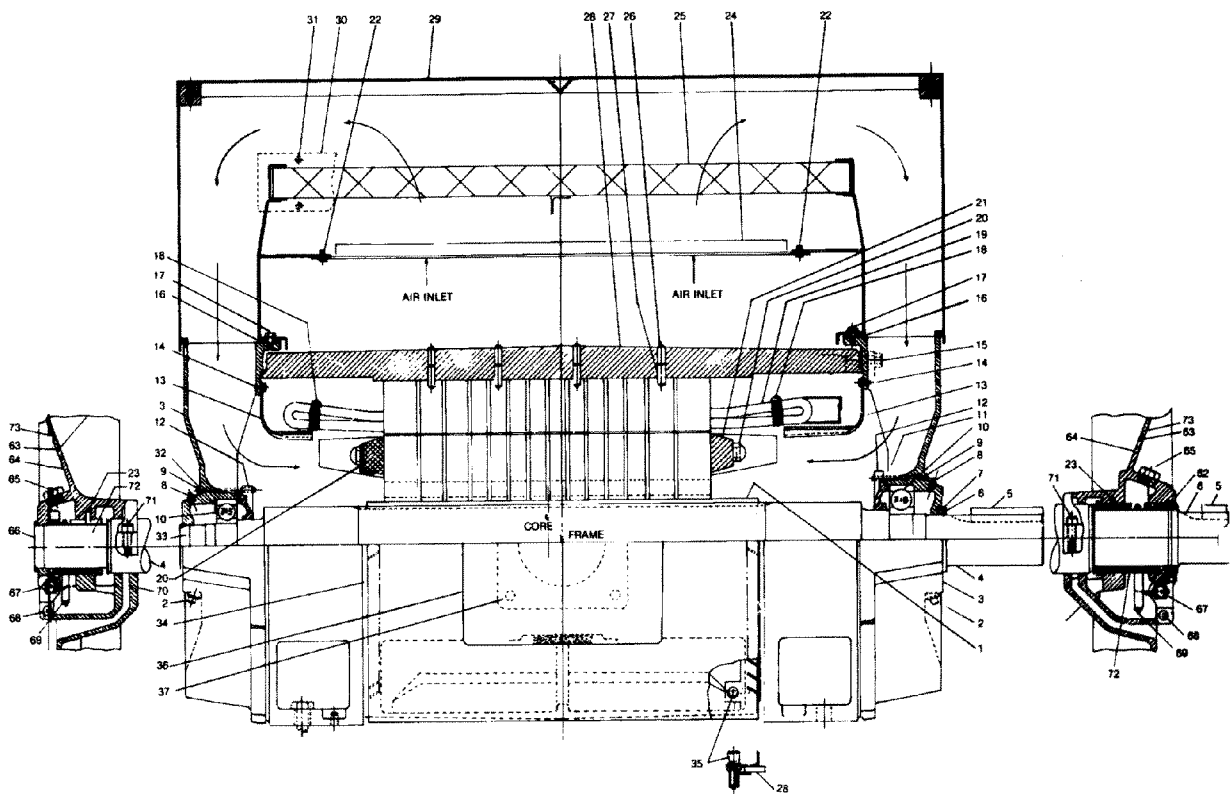
- | | |
|-------------------------|--------------------------|
| 1 Drain plug | 21 Bearing cap |
| 2 End shield | 22 End shield |
| 3 Shaft | 23 Spring washer |
| 4 Key | 24 Anti-friction bearing |
| 5 Grease fitting | 25 Dust cap |
| 6 Bearing cap screws | 26 Conduit box |
| 7 Anti-friction bearing | 27 Conduit box screws |
| 8 Bearing cap | 28 Gasket |
| 9 End shield bolt | 29 Coil bracing |
| 10 Air deflector screw | 30 Upper-half end shield |
| 11 Air deflector | 31 Oil ring location |
| 12 Rotor key | 32 Upper bearing cap |
| 13 Balance weights | 33 Dust cap |
| 14 Rotor winding & fan | 34 Oil level gauge |
| 15 Dowel hole cover | 35 Drain plug |
| 16 Dowel pin | 36 Oil ring |
| 17 Rotor punching | 37 Lower-half end shield |
| 18 Frame | 38 Bearing |
| 19 Stator winding | 39 Bearing cap bolt |
| 20 Air deflector | 40 Dowel pin |




500 Frame - WP II


- | | | | |
|--------------------------|----------------------------|-------------------------------|--------------------------|
| 1 Rotor key | 21 Rotor winding & fans | 41 Locknut | 61 Grounding strip |
| 2 Drain plug | 22 Louver screws | 42 Accessory box cover | 62 Water seal |
| 3 End shield | 23 Dowel pin | 43 Accessory box leads | 63 Gasket |
| 4 Shaft | 24 Louver | 44 Terminal | 64 Upper bearing cap |
| 5 Key | 25 Filter | 45 Round head screws | 65 Oil ring location |
| 6 Slinger | 26 Dowel hole cover | 46 Accessory box cover screws | 66 Dust cap |
| 7 Set screws | 27 Dowel pin | 47 Terminal board | 67 Oil level gauge |
| 8 Grease fitting | 28 Frame | 48 Accessory conduit box | 68 Drain plug |
| 9 Bearing cap screws | 29 Top Cover | 49 Nipple | 69 Oil ring |
| 10 Anti-friction bearing | 30 Cover - filter | 50 Gasket | 70 Lower-half end shield |
| 11 Gasket | 31 Screw filter cover | 51 Gasket | 71 Bearing cap bolt |
| 12 Bearing cap | 32 Spring washer | 52 Adapter-frame screws | 72 Bearing |
| 13 Air deflector | 33 Dust cap | 53 Gasket | 73 Upper-half end shield |
| 14 Air deflector screws | 34 Side cover | 54 Terminal plate | |
| 15 End shield bolts | 35 Side cover - grip latch | 55 Adapter-conduit box | |
| 16 Gasket | 36 Conduit box | 56 Added cable & terminal | |
| 17 Top cover screws | 37 Conduit box screws | 57 Shrink tubing | |
| 18 Coil bracing | 38 Marking strip | 58 Insulation | |
| 19 Stator winding | 39 Bronze grounding screw | 59 Crimp connector | |
| 20 Balance weights | 40 Escutcheon pins | 60 Original cable | |





VII. FAILURE


	<i>An extreme overload or electrical failure may result in heating or arcing which can cause the insulation to give off noxious fumes. All power should be removed from the motor circuit as a precaution even though the circuit has overload protection. Personnel should not approach the motor until adequate ventilation of the area has purged the air of fumes. When covers of a motor are removed after a failure, care should be observed to avoid breathing fumes from inside the motor. Preferably, time should be allowed for the motor or generator to cool before attempting any examination or repair.</i>
Warning	
<i>Failure to observe these precautions may result in injury to personnel.</i>	

	<i>Water should not be applied to any electrically energized equipment because electric shock could result in serious or fatal injury. In case of fire, disconnect all power and use a carbon dioxide extinguisher to quench the flame. Before operating any motor after a suspected failure, it should be inspected for damage.</i>
Warning	

VIII. REPAIR

Repairs should be made only by qualified personnel using the materials and processes for which the motor was designed. To protect the warranty during the warranty period, all repairs must be made in a GE Service Shop or GE

approved repair facility. Many repairs can be easily performed with only assembly operations if GE replacement parts are available. If major repairs are undertaken (such as rewinding a stator), proper facilities should be available and suitable precautions observed.

	<i>When burning off old insulation materials or when welding near insulation during re-winding, adequate ventilation must be provided to avoid exposing personnel to noxious fumes. Combustion of exhaust must be complete and adequately vented to the outside atmosphere in compliance with acceptable standards.</i>
Warning	
<i>Exposure of personnel to air-borne inorganic fibers must be avoided by adequate ventilation or by wetting the remaining insulation components following the burning off of the organic materials.</i>	
<i>Failure to observe these precautions may result in injury to personnel.</i>	

IX. RENEWAL PARTS

The use of only GE renewal parts is recommended. When ordering, specify model number and serial number of motor (complete nameplate data is desirable). Specify quantity and describe part.

For information and service, refer to the nearest GE Sales Office or GE Authorized Service Shop.

This page left intentionally blank



Reader Comments

General Electric Company

To:
 GE Industrial Systems
 Attn: Industrial Engineering
 Technical Publications Editor
 2000 Taylor Street
 Fort Wayne IN 46801-2205
 Fax: 1-260-439-3881
 (GE Internal DC: 8*380-3881)

We welcome comments and suggestions to make this publication more useful.

Your Name	Today's Date	If needed, how can we contact you?
Your Company's Name and Address	Job Site	Fax No. _____
	GE Requisition No.	Phone No. _____
Your Job Function / How You Use This Publication	Publication No.	E-Mail _____
	Publication Issue / Revision Date	Address _____

General Rating

	<i>Excellent</i>	<i>Good</i>	<i>Fair</i>	<i>Poor</i>	<i>Additional Comments</i>
Contents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Organization	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Technical Accuracy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Clarity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Completeness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Drawings / Figures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Tables	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Referencing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Readability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____

Specific Suggestions (Corrections, information that could be expanded on, and such.)

<i>Page No.</i>	<i>Comments</i>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Other Comments (What you like, what could be added, how to improve, and such.) _____

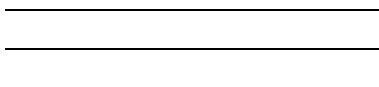
Overall Grade (Compared to publications from other manufacturers of similar products, how do you rate this publication?)

Superior Comparable Inferior Do not know Comment _____

Detach and fax or mail to the address noted above.

.....Fold here and close with staple or tape.....

Place
Stamp
Here



GE INDUSTRIAL SYSTEMS
INDUSTRIAL ENGINEERING TECHNICAL
PUBLICATIONS EDITOR
2000 TAYLOR STREET
FORT WAYNE IN 46801-2205 USA

.....Fold here first.....

Document Revision History

<u>Rev #</u>	<u>Date</u>	<u>Author</u>	<u>ISAAC #</u>	<u>Description</u>
0	11/17/99	GJG	N/A	Converted from PageMaker.
1	03/02/09	MMD	09-0224	Added Quantum 315 LMV to manual