



Service Information

File In/With:

Supersedes SI0305 (820), SI0415 (1119), SI0305 (1022)

SI0305

REV

823

Equipment Affected: YK, YT, YD, YS, CYK, YKEP
with Electric Drive Motors

York Chiller Motor Re-lubrication Instruction
with Grease Lubricated Bearings

GENERAL

Johnson Controls supplied electric drive motors have maintenance requirements for re-lubrication (greasing) of the drive end (DE) and non-drive end (NDE) ball bearings.

In recent years the type of grease to be utilized is typically identified on the motor data plate. Below, in *Table 1*, we have provided a quick guide. However, always perform a verification with the motor data plate - any differences between the quick guide and the motor data plate must be communicated to the product technical support (PTS) team prior to completing the greasing application.

TABLE 1 - GUIDE TO MOTOR GREASING AND SHAFT ROTATION INTERVALS

Anti friction/ Ball Bearing Motor	Hours to Lube	Max Shaft Idle Time Frame	Preferred Grease*	Alternate Grease*	Grease Quantity	Grease Method Preferred**	***Alternate Grease Method
Weg	1100	90 Days	Mobil Polyrex EM	N/A	404/405 8g, 444/445 8g, 447/449 8g, 5010 8g L5010 15g L5809 19g	At Rest	Operational
Toshiba	1000	90 Days	Mobil Polyrex EM	N/A	1.5 cubic inches	At Rest	Operational
Teco	1000	90 Days	Mobil Polyrex EM	Chevron SRI-2	1.5 cubic inches	Operational	At Rest
ABB	Per Data Plate	90 Days	Klubberplex BEM41-132	Mobilith SHC100	1.5 cubic inches	Operational	At Rest
Ram	1000	90 Days	Mobil Polyrex EM	Chevron SRI-2	1.5 cubic inches	At Rest	Operational
Reliance	1000	90 Days	Shell Alvania RL3	Mobilith SHC100	1.5 cubic inches	At Rest	Operational
Siemens	1000	90 Days	See Manufacturers nameplate for applicable grease	N/A	See Manufacturers nameplate for applicable quantity	At Rest	N/A

* Never mix grease type or brand. If changing from or to the alternate or preferred, the bearing cavities, housings, and lines must be cleaned of the old grease.

** Follow all standard lockout tag out procedures prior to greasing motor.

** After greasing motor at rest - run motor for minimum of 45 minutes before replacing plug, if equipped.

*** Motor must be equipped with grease extensions on DE bearing for performance of this task.

Verify with motor nameplate any discrepancy before lubricating - contact technical support for additional information/clarification.

Remove grease plug if equipped - prior to greasing. Not every grease interval will result in used grease discharge.

Note: All WEG frame sizes in *Table 1* lubricate at 1100 hours regardless of nameplate.

Work on this equipment should only be done by properly trained personnel who are qualified to work on this type of equipment. Failure to comply with this requirement could expose the worker, the equipment and the building and its inhabitants to the risk of injury or property damage.

The instructions on this service information letter are written assuming the individual who will perform this work is a fully trained HVAC & R journeyman or equivalent, certified in refrigerant handling and recovery techniques, and knowledgeable with regard to electrical lock out/tag out procedures. The individual performing this work should be aware of and comply with all Johnson Controls, national, state and local safety and environmental regulations while carrying out this work. Before attempting to work on any equipment, the individual should be thoroughly familiar with the equipment by reading and understanding the associated service literature applicable to the equipment. If you do not have this literature, you may obtain it by contacting a Johnson Controls Service Office.

Should there be any question concerning any aspect of the tasks outlined in this bulletin, please consult a Johnson Controls Service Office prior to attempting the work. Please be aware that this information may be time sensitive and that Johnson Controls reserves the right to revise this information at any time. Be certain you are working with the latest information.

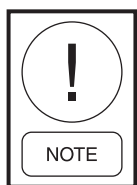
PROCEDURE

Greasing:

In most cases, re-lubrication must be performed with the motor shut down and at rest. However, in some cases, it may be performed with the motor operating - see *Table 1*.

The specified amount of grease should be added at each specified interval to both the DE and NDE bearings. Current YORK OptiView panels provide a warning message to re-lubricate beginning at a programmed number of operating hours (the default value is 1000 hours). At the programmed value plus 400 hours this feature will shut down the chiller if re-lubrication is not addressed. In plants where chillers run 24/7, there is more than 16 days of advance warning prior to shutting down the chiller.

1. Open the relief port plug below the bearing, if equipped.
2. Add the specified amount of grease, as per *Table 1*.



Only pump the required number of pumps as determined by the calibration procedure below. Do not expect old grease to exit at the relief port.

3. Run the motor for 30 to 45 minutes.

It is not necessary to see old grease coming out from the relief port after adding the new grease.

4. Re-install the plug.

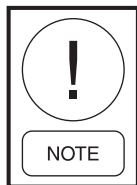
Motor Rotation:

All motors must be rotated if idle for 90 days. The rotation should allow for the keyway to be positioned differently than when the rotation process was started. For example, if the keyway is at the twelve o'clock position, after the rotation the keyway should be at another position, for example, the three o'clock position.

GREASE GUN CALIBRATION

Grease guns should be calibrated to determine the number of pumps required to get 1.5 cubic inches of grease. To calibrate,

1. Form an open-top cardboard cube (1 in. x 1 in. x 1 in.).
2. Pump grease into this container until the grease is level with the top, counting the number of pumps.
3. When the grease is level with the top, this is the number of pumps for one cubic inch of grease.
4. Multiply the number of pumps by 1.5 to get the number of pumps for YORK chiller motor bearings.



Over-greasing can be as detrimental as under-greasing, or total lack of greasing. A bearing housing over-filled with grease can run 20° centigrade higher temperature than one with the proper amount of grease.

Similarly, for motors requiring fixed number of grams of grease, a scale should be used to determine the number of pumps required to achieve the number of grams prescribed.

TYPE OF GREASE

All standard YORK chiller motors utilize a polyurea grease, specifically formulated for high-speed rolling element bearings. Only two greases are approved for most standard chiller motors:

Preferred choice: Mobil Polyrex EM - Grainger part number 5XB54

2nd choice, for TECO and Ram: Chevron SRI #2

There are a few exceptions, such as Reliance Q-frame motors built from 1997 to 2003, and some special order motors, such as medium-voltage motors from Siemens and ABB. In these cases, use only grease called for by the motor manufacturer.

For Reliance motors, there is a metal tag affixed to the motor calling for Texaco Premium RB grease. This is a lithium based lubricant and should never be mixed with polyurea grease. When the two products come together, the thickeners release their oil molecules and oil settles in the bottom of the bearing housing, or exits at the relief plug or around the shaft. Bearings can fail within 1000 hours when non-compatible greases become mixed. If you are unable to locate this specific Texaco product, other approved lithium based greases are Shell Alvania RL3 in NLGI #3 or Mobilith SHC100 NLGI #2, Grainger P/N 4ZF49.

We cannot approve use of any general purpose or "EP" (extended pressure) greases, for the following reasons:

1. They are unlikely to contain all the properties required for the very demanding application of rolling element bearings at 3600 RPM.
2. None of these have been approved by any major motor manufacturer or electric motors up to 2000 HP.
3. Additives contained in "EP" greases have been found to chemically attack the windings in electric motors.

"EP" greases are intended for very heavy, slow-moving loads, such as earth-moving equipment. They are not a proper grease for electric motors.

Unless specifically approved by the motor manufacturer, no synthetic greases are to be used. It is not best practice to mix synthetic greases with mineral oil based grease, which is the type of grease that is inside the motor bearings as shipped from the YORK factory.



Mixing different greases is not recommended.

OPERATING TEMPERATURE

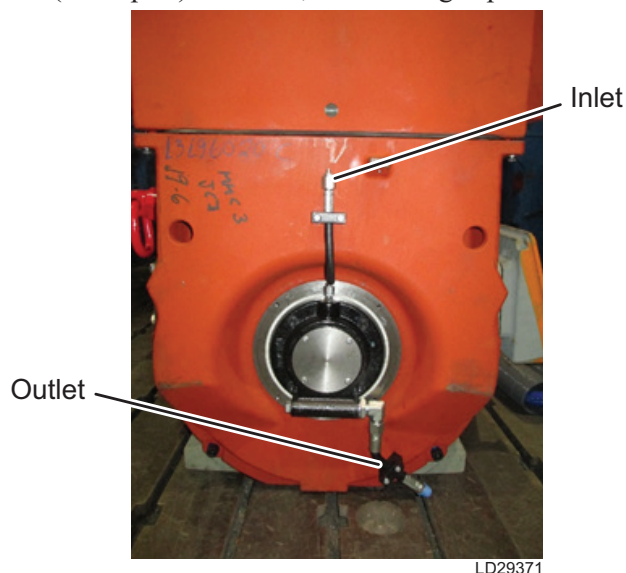
Normal operating temperature for grease lubricated bearings on YORK chillers is 40°C to 65°C (100°F to 150°F). It is normal to see the temperature elevate immediately after re-lubrication, and then come down as much as 20°F after a few hours of operation.

- If the temperature exceeds 65°C, at which point a warning is issued, it is an indication that either the bearings are in need of lubrication or that something is wrong, and operation should be checked.
- If temperature reaches 70°C, it generally indicates some type of problem.
- Bearing RTDs are normally set to shut down the motors at 90°C (194°F), although once this temperature is reached, the bearings most likely have already been compromised.

BEARING LUBRICATION PROCEDURE

The procedure to properly re-lubricate a motor DE/NDE ball bearing every identified hours of operation according to *Table 1*. Grease can be added while the motor is running or idle. Read these instructions completely before starting the re-lubrication process.

1. Motor Overview: Grease inlet and outlet (relief port) locations, and bearing cap.



LD29371

2. Clean the grease inlet and grease gun nozzle to prevent introducing contaminants or abrasives into the bearing.



LD29372

3. Remove the drain plug and clean old grease from the drain opening.



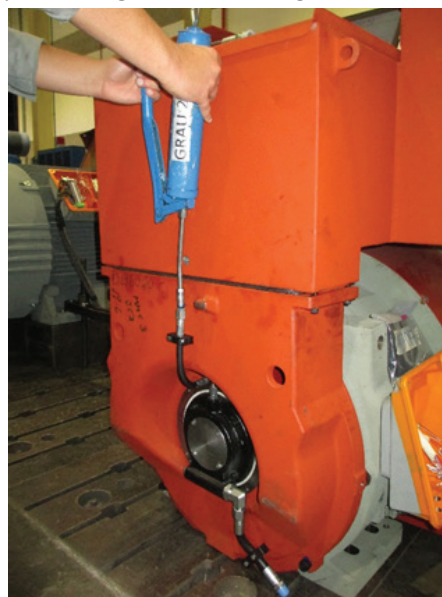
LD29373

Grease Outlet

4. Use grease in the following quantities based on *Table 1*

NOTE: It is not guaranteed grease will exit from the grease relief port.

5. Using a hand operated grease gun, pump the Polyrex EM grease into the grease inlet.



5010 Frame Motor

LD29374

NOTE: When the motor is running, grease may or may not exit the grease relief port.

6. After the re-greasing process is completed, the bearing temperature will rise approximately 30 – 40° F for a period of time and then return to a normal operating range depending on motor load.

WARNING: Take the temperature of the bearing cap with a remote temperature measurement device. When measuring the temperature on the drive end of the motor, use extreme caution when near the rotating shaft to avoid severe injury or death.

However, if the bearing housing is too full, the temperature will stay elevated. At this point, it may be necessary to lock out power to the motor, wait until the shaft comes to a complete stop, and clear the grease from the bearing cap.

GREASE AND GREASE GUN STORAGE BEST PRACTICES

Use these best practices for grease and grease gun storage:

- Hang grease guns horizontally inside a clean, fireproof cabinet with the plunger disengaged from the tube to mitigate the following:
 1. Excessive pressure on the spring and plunger that potentially increases wear and change to the amount of lubricant it exerts on each pump.
 2. If there is a tube of grease inside the gun and the base oil begins to bleed out of the thickener, you would prefer that base oil be evenly distributed inside the tube. This will help prevent just pumping thickener into the motor bearings.
- Dispose of nonworking / defective grease guns immediately to avoid them being used again.
- Keep the lid on the kegs (buckets) when not refilling a grease gun. Kegs should also be stored inside a clean cabinet. When refilling a grease gun, ensure the plunger and outside of the gun are clean. If they are not, you will be introducing contaminants into the keg.
- Grease purchased in tubes should be stored vertically with the removable seal on top and preferably inside the original box in which they were delivered. Having the seal on top helps prevent oil leakage in the event the base oil begins to separate from the thickener.
- Grease tubes should be stored inside a clean cabinet.
- Regardless of how grease is received (bucket or tube) it should be stored inside in a climate-controlled room to minimize the oxidation of the grease due to heat and moisture ingress.
- It is important to mark the date when your greases were received and when they will expire.

MOTOR SUPPLIER IDENTIFICATION

The following describes how to identify the motor manufacturer by the nameplate supplied by the supplier and the motor part number stenciled on either the main motor nameplate or on an auxiliary nameplate. If there is any uncertainty in who the motor manufacturer is, please contact JCI product technical support for clarification.

WEG

Following is an example of a WEG motor nameplate. It includes on the left-hand side stenciled vertically “MADE BY WEG” (circled in red).



LD32685

Example WEG motor nameplate

* Please note in this example the old regreasing interval. Per this SI, the regreasing of the bearings is to occur at 1100 hrs. for all WEG motors.

The motor part number (circled below) is stenciled on an auxiliary nameplate typically located on the opposite side of the motor, next to the other aux. nameplates. WEG ODP, WPI and WPII motors have a 024-XXXXX-2XX part number.

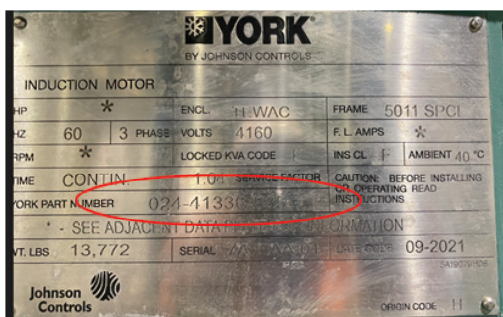


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Example WEG aux. motor nameplates
(JCI part number circled)

TECO WESTINGHOUSE

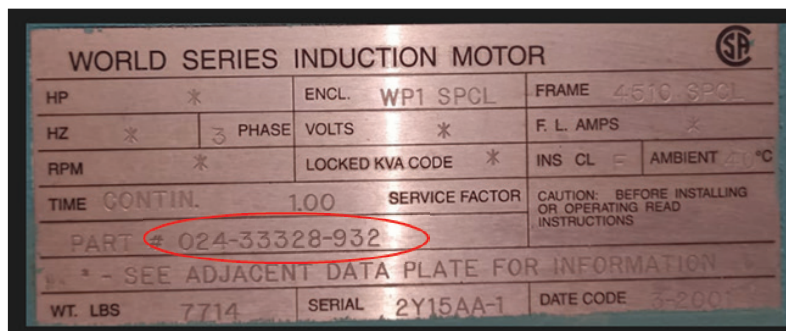
Following are examples of a Teco Westinghouse motor nameplate. Teco typically includes the JCI motor part number (circled) on the main nameplate. Teco Westinghouse ODP, WPI and WPII motors typically have a 024-XXXXX-8XX part number. Some older Teco Westinghouse motors use a -9XX suffix (see example below).



LD32688

Example Teco Westinghouse motor nameplate

Some older Teco Westinghouse motors have this style nameplate:



LD32687

Example Teco Westinghouse motor nameplate

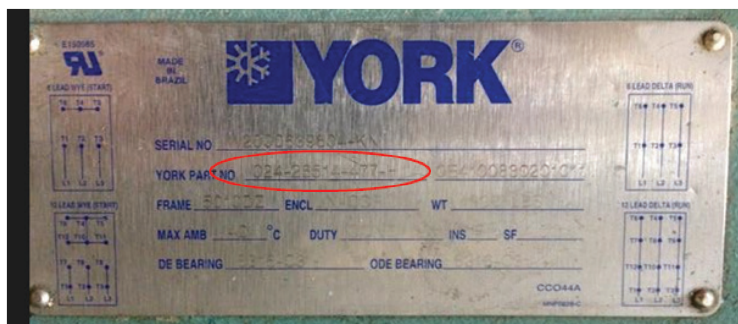
Teco Westinghouse motors may also include aux. nameplates with additional information that indicates they are from Teco Westinghouse. For example:



LD32689

RAM

Following is an example of a RAM motor nameplate. RAM typically includes the JCI motor part number (circled) on the main nameplate. RAM ODP, WPI and WPII motors typically have a 024-XXXXX-4XX part number.

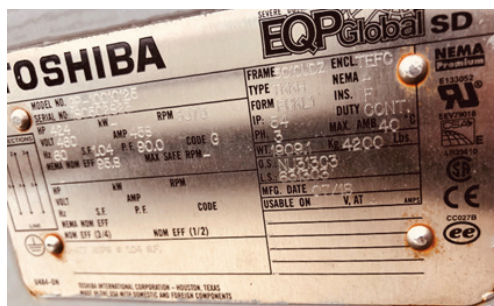


Example RAM motor nameplate

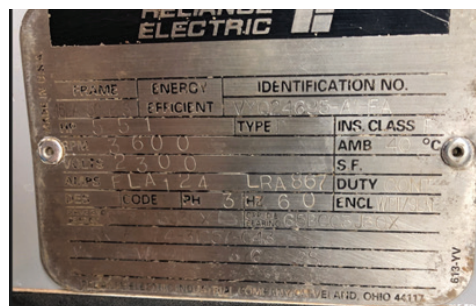
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TOSHIBA, RELIANCE AND ABB

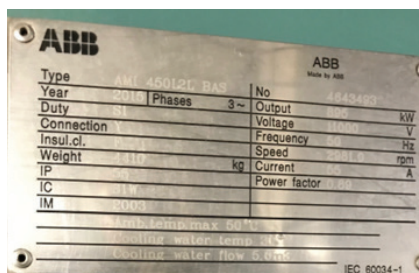
These suppliers typically include their name on their respective motor nameplate. Following are examples of each:



Example Toshiba motor nameplate



Example Reliance motor nameplate



Example ABB motor nameplate

LD32722