



Cause of Failure 600 HP Toshiba Motor

Prepared for _____

Dreisilker Electric Motors, Inc.

352 Roosevelt Road

Glen Ellyn, IL 60137

Motor Nameplate Information

WORLD ENERGY SERIES	
3-PHASE INDUCTION MOTOR	
MODEL NO. 4DG600I 194121	
VOLTS 2300	AMP. 135
TYPE TIKK	FRAME 5810UZ
FORM FRKT4	SERVICE FACTOR 1.15
HP 600	BRG. NO. L.S. NU328G3
POLES 4	O.S. 632803
CLASS INS.	RPM 1775
DESIGN	MAX. AMB. 40 °C
CODE 6	TIME RATING CONT.
Hz 60	SER. # 15050234

Motor Findings

- Oil drippings from bearing grease found at bottom of stator
- Grease on DE winding head coils
- False brinelling on DE bearing outer raceway surface
- Scratch lines on DE rollers and inner raceway surface, scratch lines on the inner race are closer to the output shaft opening
- Rust or fretting on one third of DE bearing journal on the output shaft side
- DE bearing journal measures in tolerance
- Rust or fretting visible on the DE bearing inner race journal surface, keyway from locknut also visible in the rust or fretting
- Appears to be no uneven wear on the pulley grooves
- Pulley arrived rusted
- Motor has a labyrinth and felt seal on the DE bearing cap opening
- Motor has a felt seal on the ODE bearing cap opening
- Winding RTD leads were taped off at ends and do not reach the terminal opening inside the stator frame

Motor Failure Pictures

Incoming



Incoming



Motor Failure Pictures

Drive End



DE labyrinth and exterior bearing cap with felt seal



Motor Failure Pictures

Drive End Bearing Housing Removal



Drive End Bearing and Grease



Motor Failure Pictures

Drive End Bearing Grease



Drive End Bearing Housing Grease



Motor Failure Pictures

Grease on DE Winding Head



DE Winding Head



Motor Failure Pictures

Scratch Marks on DE Bearing Rollers



**Scratch Marks on DE Inner Raceway
(more prominent on output shaft side)**



Motor Failure Pictures

Rust or fretting on DE journal output shaft side (dimensionally all the same)



Rust or fretting on DE bearing inner race with visible mark of locknut keyway (red arrow)



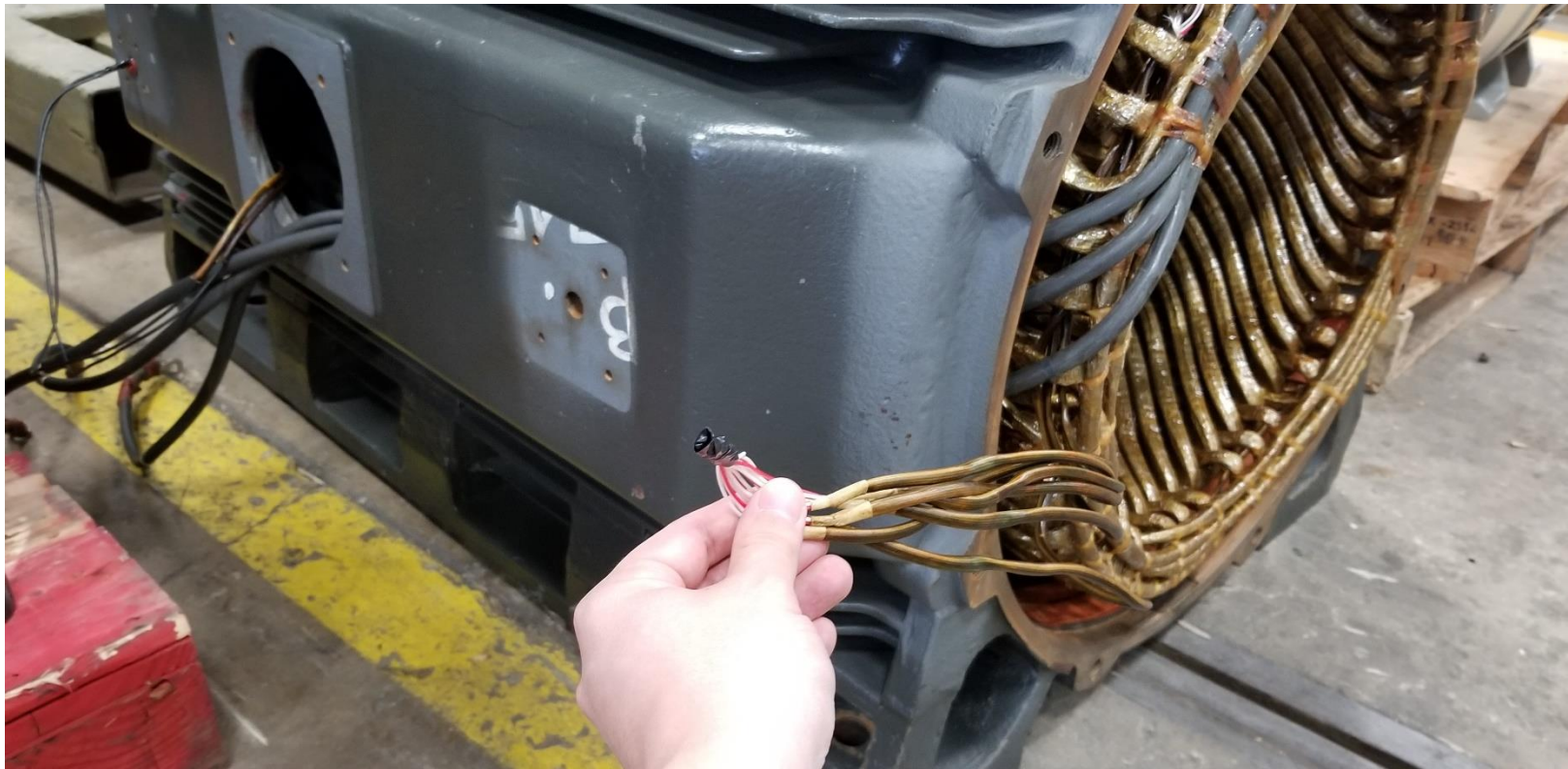
Motor Failure Pictures

False Brinelling on DE bearing outer raceway



Motor Failure Pictures

Winding RTD leads taped off and do not reach the terminal opening



Cause/Causes of Failure

- Felt seal failed to keep contaminants out of bearing housing
- Water or liquid got under the DE bearing and rusted
- Contaminants scratched the rollers and raceway surfaces (more prominent on output shaft side because rust expands in size so the raceway was slightly pressed upwards)
- False brinelling occurred from external vibration source when motor was not operating in storage, transportation, or on machine during shutdown

Methods for Prevention of Failure

- Prevent contamination from entering motor
- Dreisilker as an option has quoted modifying the outside bearing caps to hold a lip seal, replacing the felt seals
- Prevent exterior vibration sources when the motor is not in operation