



Cause of Failure for 200 HP Weg Motor

Prepared for \_\_\_\_\_

Dreisilker Electric Motors, Inc.

352 Roosevelt Road

Glen Ellyn, IL 60137

# Motor Nameplate Information

|              |                   |              |        |
|--------------|-------------------|--------------|--------|
| Make         | : WEG             | AC/DC/Other  | : AC   |
| Model        | : 20018E3P3GRB445 | Hertz        | : 60   |
| Serial No.   | :                 | Phase        | :      |
| Motor Type   | :                 |              |        |
| Phys Type    | : T.E.F.C.        | Serv. Factor | : 1.15 |
| Mounting     | :                 | Insul. Class | : F    |
| Frame Size   | : 444/5T          | Ambient      | : 40C  |
|              |                   | Code         | :      |
| Power Value  | : 200             | Design       | :      |
| Power Rating | : HP              |              |        |
| Voltage      | : 460             |              |        |
| AMPS         | : 225             |              |        |
| RPM          | : 1780            |              |        |

# Motor Findings

- Motor was repaired by another repair shop
- Evidence of Burnout Stripping
- Winding test okay but overheated on DE winding head
- DE bearing failed
- Balancing weight from rotor found inside motor
- Repair sleeve found on DE shoulder of journal
- DE Journal was metal sprayed and machined out of tolerance and egg shaped (max tolerance = 95.028, journal at 95.061 to 95.081) and bearing inner race had to be cut off for removal

# Motor Failure Pictures

**Incoming Picture**



**Incoming Picture**



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# Motor Failure Pictures

**Overheated Insulation and DE bearing Grease Contamination on DE Winding Head**



**ODE Winding Head with DE bearing Grease Contamination**





# Motor Failure Pictures

**Broken Bolts on DE Bearing Cap**



**DE Bearing Failure**



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# Motor Failure Pictures

**DE Bearing Inner Race Fretting from Ineffective Oversized Interference Fit**



**DE Shaft Journal Fretting from Ineffective Oversized Interference Fit**

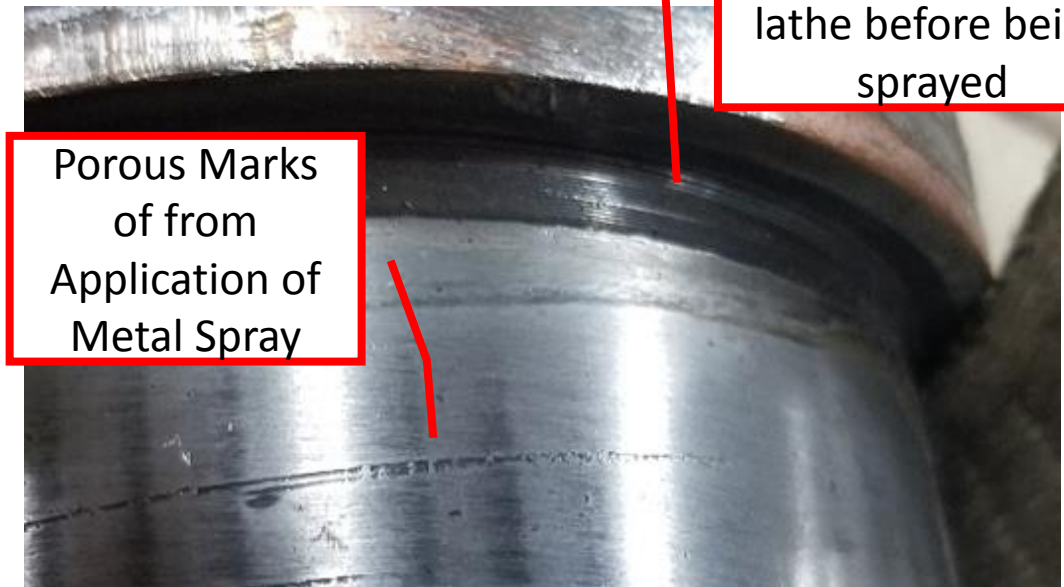


# Motor Failure Pictures

## Porosity Marks on DE Journal, Evidence of Metal Spray



## Close Up of Machined DE Journal Surface





# Motor Failure Pictures

**DE Bearing Roller, Evidence of Ineffective Lubrication or Starvation**



**DE Bearing Rollers and Cage, Evidence of Ineffective Lubrication or Starvation**



Dreisilker Electric Motors, Cause of Failure for 200 HP Weg Motor

# Cause/Causes of Failure

- The DE bearing journal was metal sprayed and machined out of tolerance oversized
- The DE bearing began fretting causing overheating and breakdown of lubrication (no evidence of contamination, bearing race ways failed catastrophically)

# Methods for Prevention of Failure

- Ensure motor repair shop is machining bearing dimensions to proper tolerances and not using metal spray
- Metal spraying/metalizing leaves a porous surface and should NOT be used to repair rotating components like bearing mating surfaces. Vibration will occur when the rolling elements pass over the pours left from the metal spraying process
- Check lubrication routes on this motor to determine if lack grease accelerated the motor failure (although evidence of burnt grease was in the windings)

# Other Repair Considerations

- On this squirrel cage induction motor, the repair shop put two part balancing weight behind the rotor end ring. When the motor overheated it fell off. This was not necessary to use because the rotor has built in balancing posts for adding weight. The weight could have fallen off and destroyed the windings if not for the bearing failure
- The use of a burnout oven cause frame warpage and caused excessive splaying of the laminations



# Additional Repair Considerations

## Repair Sleeve on DE Journal Shoulder



## Excessive Splaying from Burnout Oven Stripping



# Additional Repair Considerations

**Two Part Balancing Weight in Windings**



**Two Part Balancing Weight from Inside Rotor**

