Hi-Speed Industrial Service
7030 Ryburn Dr
Millington, Tn 38053
901-873-5300

AC Inspection as Found

Phelps Fan Manufacturing Co.
10701 Interstate 30
Little Rock, AR 72209

FolderID: 103341
FormID: 21247090

AC Inspection - Rev. 2

Location:	MOTOR SHOP LR
Serial Number:	TAE6156426011
Description:	20HP/15KW TECO

Hi-Speed Job Number:	103341
Manufacturer:	TECO Westinghouse
Serial Number:	TAE6156426011
HP/kW:	20 (HP)
RPM:	3525 (RPM)
Frame:	256TZ
Voltage:	208-230/460
Current:	49.9-45.0/22.5
Phase:	Three
Hz:	60 (Hz)
Service Factor:	1.15
Enclosure:	TEFC
# of Leads:	9
J-box Included:	Half
Coupling/Sheave:	None
Date Received:	08/08/2024
Bearing RTDs:	No
Stator RTDs:	No
Repair Stage:	Final
Rewind:	Yes
Shaft Machined Fit Repairs Required:	Yes
Bearing Housing Machined Fit Repairs Required:	Yes
Heaters:	No
Winding Type :	Random Wound
Bearing Type:	Rolling Element

Priorities Found: **8 - High** **5 - Good**

Overall Condition

1.	Report Date	**08/12/2024**

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2. Nameplate Picture P37

3. Photos of all six sides of the machine. P45

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	4.	Describe the Overall Condition of the Equipment as Received ***Serviceable***	
	5.	Report Date [COPY]	**08/09/2024**

Initial Mechanical/Electrical

●	6.	Does Shaft Turn Freely?	**(N) No**
●	7.	Does the shaft require T.I.R in Lathe to identify additional repairs?	**(Yes) Yes**
	8.	Does Shaft Have Visible Damage?	**(Yes) Yes**
	9.	Assembled Shaft Runout ***Unable to perform.***	**Inches**
●	10.	Assembled Shaft End Play	**0.25 inches**
	11.	Air Gap Variation <10%	

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12.	Lead Condition	**(P) Pass**	P69

13.	Lead Length	**5.25 Inches**	
14.	Does it have Lugs?, If so what is the Stud Size?	**(No) No**	
15.	Lead Numbers	**1-9**	
16.	Frame Condition	**pass**	
17.	Fan Condition	**(P) Pass**	P116

18.	Broken or Missing Components	**top connection box cover missing**

Initial Electrical Inspection

19.	Insulation Resistance/Megger	**Megohms**
20.	Winding Resistance	

1-2	1-3	2-3

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21.	Perform Surge Test	**(NA) Not Applicable**	P57

22.	Number of Stator Slots	**36**
23.	Stator Condition	**rewind**
24.	Stator Thermistors/Ohms	
25.	Stator Overloads/Ohms	

Mechanical Inspection

26.	Drive End Bearing Brand	**unknown**	
27.	Drive End Bearing Number-	**6309Z**	
28.	Drive End Bearing Qty.	**1**	
29.	Drive End Bearing Type	**(Ball) Ball Bearing**	P51

30.	Drive End Lubrication Type	**(Grease) Grease Lubricated**
31.	Drive End Bearing Insulation or Grounding Device?	**none**
32.	Drive End Wavy Washer/Snap-Ring Other Retention Device?	**none**
33.	Drive End Bearing Condition	
	Bearing suffered catastrophic cage failure	
34.	Opposite Drive End Bearing Brand	**Taiwan**
35.	Opposite Drive End Bearing Number-	**6307**
36.	Opposite Drive End Bearing Qty.	**1**
37.	Opposite Drive End Bearing Type	**(Ball) Ball Bearing**
38.	Opposite Drive End Lubrication Type	**(Grease) Grease Lubricated**
39.	Opposite Drive End Bearing Insulation or Grounding Device?	**none**

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40.	Opposite Drive End Wavy Washer/Snap-Ring Other Retention Device?	**wavy washer**	P115
	Needs replacing		

41.	Opposite Drive End Bearing Condition	**worn**	P119

42.	Drive End Seal	
43.	Opposite Drive End Seal	

Rotor Inspection

44.	Rotor Type/Material	**(Squirrel Aluminum) Squirrel Cage Aluminum Die Cast**
45.	Growler Test	**(Pass) Pass**
46.	Number of Rotor Bars	**28**
47.	Rotor Condition	**pass**
48.	List the Parts needed for the Repair Below ***Bearings***	
49.	Signature of Technician that Disassembled Motor	**Terrence Holland**

Mechanical Fits- Rotor

50.	Shaft Runout	**inches**	
	Unable to measure because of the DE shaft bearing journal.		

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	51.	Rotor Runout		
		Drive End Bearing Fit	Rotor Body	Opposite Drive End Bearing
	52.	Coupling Fit Closest to Bearing Housing		
		0 Degrees	90 Degrees	120 Degrees
●	53.	Coupling Fit Closest to the end of the Shaft		
		0 Degrees	60 Degrees	120 Degrees
	54.	Drive End Bearing Shaft Fit		P79
		0 Degrees	60 Degrees	120 Degrees

Failed. Excessively wear from total bearing failure.

●	55.	Drive End Bearing Shaft Fit Condition		**(F) Fail**
	56.	Opposite Drive End Bearing Shaft Fit		
		0 Degrees	60 Degrees	120 Degrees
		1.3783	**1.3782**	**1.3782**
●	57.	Opposite Drive End Bearing Shaft Fit Condition		**(P) Pass**
	58.	Shaft Air Seal Fits		
		Drive End Air Seal	Opposite Drive End Air Seal	

Mechanical Fits- Bearing Housings

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59.	Drive End - Endbell Bearing Fit			P2
	0 Degrees	60 Degrees	120 Degrees	

60.	Drive End - Endbell Bearing Fit Condition	**(F) Fail**
	Excessive wear and pitting	
61.	Opposite Drive End - Endbell Bearing Fit	P30
	0 Degrees	60 Degrees	120 Degrees

62.	Opposite Drive End - Endbell Bearing Fit Condition	**(F) Fail**
	Excessive wear and pitting	
63.	Bearing Cap Condition	
	Drive End Bearing Cap	Opposite Drive End Bearing Cap

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64. End Bell Air Seal Fits

Drive End Air Seal	Opposite Drive End Air Seal

fail

Cracked in multiple places.

65. List Machine Work Needed Below

Both housing fits.
D.E. housing shaft opening needs sleeving. Cracked in many places.
D.E. shaft bearing journal.

66. Technician **Terrence Holland**

Co sign RRW

Root Cause of Failure

67. Failure locations

Both housing fits. D.E shaft bearing journal. Windings shorted due to shrapnel from failed cage on DE bearing.

68. Root cause of failure

D.E bearing suffered total cage failure apparently due to lack of proper lubrication.

Dynamic Balance Report

69. Rotor Weight and Balance Grade

Rotor Weight	Balance Grade

70. Initial Balance Readings

Drive End	Opposite Drive End

71. Final Balance Readings

Drive End	Opposite Drive End

72. Technician

Rewind

73. Core Test Results - Watts loss per Pound

Pre-Burnout	Post Burnout

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74.	Core Hot Spot Test		
	Pre-Burnout	Post-Burnout	
75.	Post Rewind Electrical Test- Insulation Resistance		
76.	Post Rewind Polarization Index		
77.	Post Rewind Winding Resistance		
	1-2	1-3	2-3
78.	Post Rewind Surge Test		
79.	Post Rewind Hi-Pot		
80.	Technician		

Mechanical Fits- Rotor - Post Repair

81.	Shaft Runout Post Repair		
82.	Rotor Runout Post Repair		
	Drive End Bearing Fit	Rotor Body	Opposite Drive End Bearing
83.	Coupling Fit Closest to Bearing Housing Post Repair		
	0 Degrees	90 Degrees	120 Degrees
84.	Coupling Fit Closest to the end of the Shaft Post Repair		
	0 Degrees	60 Degrees	120 Degrees
85.	Drive End Bearing Shaft Fit Post Repair		
	0 Degrees	60 Degrees	120 Degrees
86.	Opposite Drive End Bearing Shaft Fit Post Repair		
	0 Degrees	60 Degrees	120 Degrees
87.	Shaft Air Seal Fits Post Repair		
	Drive End Air Seal	Opposite Drive End Air Seal	
88.	Shaft Repair Sign-off		

Mechanical Fits- Bearing Housings - Post Repair

89.	Drive End - Endbell Bearing Fit Post Repair		
	0 Degrees	60 Degrees	120 Degrees
90.	Opposite Drive End - Endbell Bearing Fit Post Repair		
	0 Degrees	60 Degrees	120 Degrees
91.	Bearing Cap Condition Post Repair		
	Drive End Bearing Cap	Opposite Drive End Bearing Cap	
92.	End Bell Air Seal Fits Post Repair		
	Drive End Air Seal	Opposite Drive End Air Seal	
93.	End Bell Repair Sign-off		

Assembly

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94.	QC Check All Parts for Cleanliness Prior to Assembly		
95.	Photograph All Major Components prior to assembly		
96.	Final Insulation Resistance Test		
97.	Assembled Shaft Endplay		
98.	Assembled Shaft Runout		
99.	Test Run Voltage		
	Volts	Volts	Volts
100.	Test Run Amperage		
	Amps	Amps	Amps
101.	Drive End Vibration Readings - Inches Per Second		
	Horizontal	Vertical	Axial
102.	Opposite Drive End Vibration Readings - Inches Per Second		
	Horizontal	Vertical	Axial
103.	Ambient Temperature - Fahrenheit		
104.	Drive End Bearing Temps - Fahrenheit		
	5 Minutes	10 Minutes	15 Minutes
105.	Opposite Drive End Bearing Temps - Fahrenheit		
	5 Minutes	10 Minutes	15 Minutes
106.	Document Final Condition with Pictures after paint		
107.	Final Pics and QC Review		

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