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

# AC Inspection as Found

**FUTURE FUEL CHEMICAL**
**2800 GAP RD HWY 394 SO**
**BATESVILLE, AR 72501**

FolderID: 102616
FormID: 19692854

### AC Inspection - Rev. 2

| | |
|---|---|
| **Location:** | MOTOR SHOP LR |
| **Serial Number:** | 1-5139-LR67718-01 |
| **Description:** | 15/7.5HP 1750/860RPM SIEMENS |

| | |
|---|---|
| **Hi-Speed Job Number:** | 102616 |
| **Manufacturer:** | Siemens |
| **Product Number:** | TYPE: RGZZ |
| **Serial Number:** | 1-5139-LR67718-01 |
| **HP/kW:** | 15 (HP) |
| **RPM:** | 1750 (RPM) |
| **Frame:** | 256TZ |
| **Voltage:** | 460 |
| **Current:** | 19.0/14.5 (Amps) |
| **Phase:** | Three |
| **Hz:** | 60 (Hz) |
| **Enclosure:** | TEFC |
| **# of Leads:** | 6 |
| **J-box Included:** | Complete |
| **Coupling/Sheave:** | None |
| **Date Received:** | 03/06/2024 |
| **Bearing RTDs:** | No |
| **Stator RTDs:** | No |
| **Repair Stage:** | Final |
| **Rewind:** | No |
| **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: **4 - High** **17 - Good**

## Overall Condition

1. Report Date

2. Nameplate Picture P37

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




| | | | |
|---|---|---|---|
| | 4. | Describe the Overall Condition of the Equipment as Received<br>***Serviceable*** | |
| **Initial Mechanical/Electrical** | | | |
| ● | 5. | Does Shaft Turn Freely? | **(Y) Yes** |
| | 6. | Does the shaft require T.I.R in Lathe to identify additional repairs? | |
| | 7. | Does Shaft Have Visible Damage? | **(No) No** |
| ● | 8. | Assembled Shaft Runout | **0.002 Inches** |
| | 9. | Assembled Shaft End Play | **inches** |
| | 10. | Air Gap Variation <10%<br>***Ha*** | |
| ● | 11. | Lead Condition | **(P) Pass** |
| | 12. | Lead Length | **9 Inches** |
| ● | 13. | Does it have Lugs?, If so what is the Stud Size?<br>***16*** | **(Yes) Yes** |
| | 14. | Lead Numbers | **1-2-3-4-5-6** |

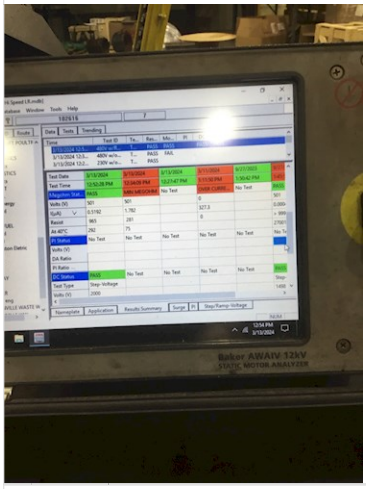
15. Frame Condition P113

16. Fan Condition P115

17. Broken or Missing Components **no**

## Initial Electrical Inspection

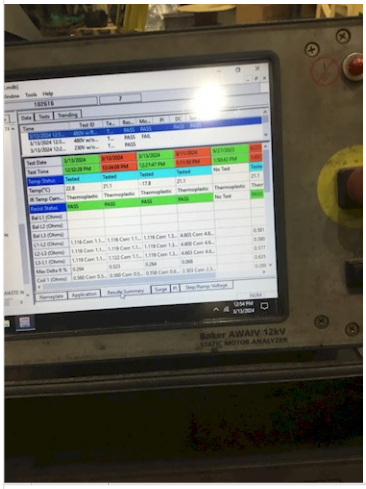
18. Insulation Resistance/Megger **Megohms** P8

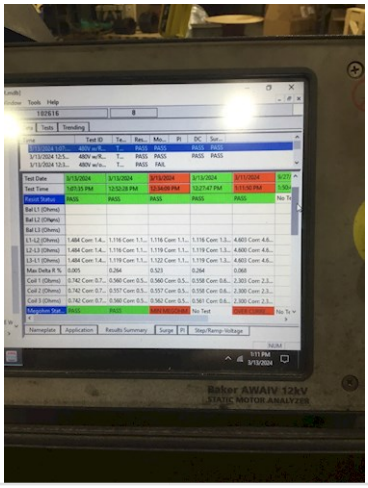


19. Winding Resistance P20

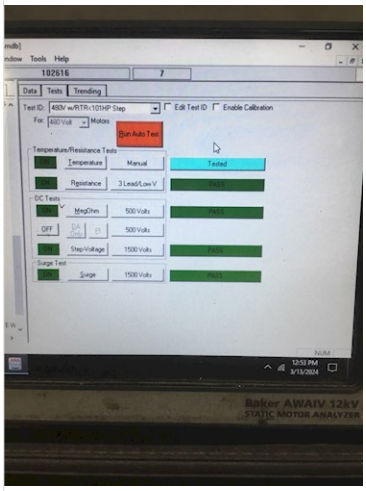
| 1-2 | 1-3 | 2-3 |
|---|---|---|

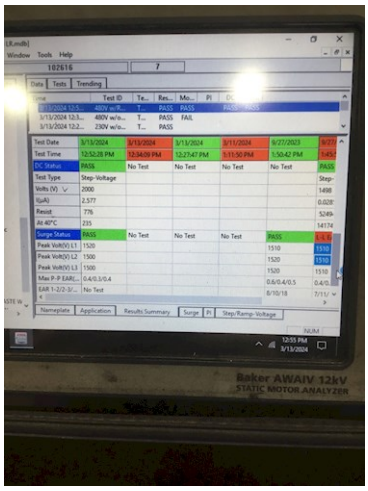
*Pass*

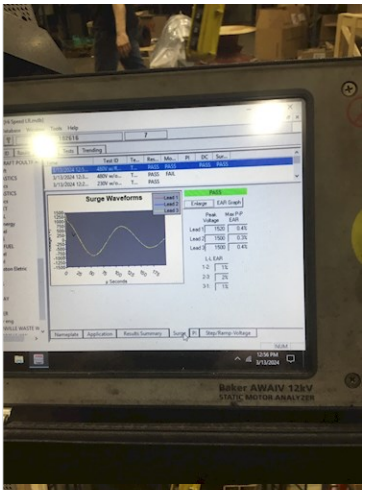


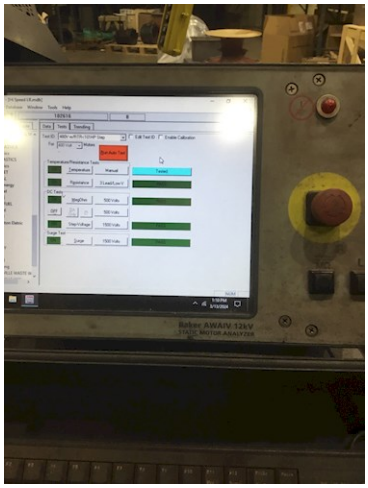


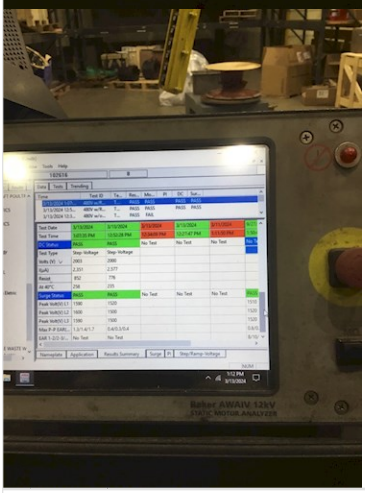
20. Perform Surge Test **(P) Pass** P57











| | | | |
|---|---|---|---|
| 21. | Number of Stator Slots | **36** | |
| 22. | Stator Condition | **pass** | |
| 23. | Stator Thermistors/Ohms | **no** | |
| 24. | Stator Overloads/Ohms | **no** | |

## Mechanical Inspection

| | | | |
|---|---|---|---|
| 25. | Drive End Bearing Brand | **koyo** | |
| 26. | Drive End Bearing Number- | **62092z** | |
| 27. | Drive End Bearing Qty. | **1** | |
| 28. | Drive End Bearing Type | **(Ball) Ball Bearing** | P51 |

| | | | |
|---|---|---|---|
| 29. | Drive End Lubrication Type | **(Grease) Grease Lubricated** | |
| 30. | Drive End Bearing Insulation or Grounding Device? | **no** | |

| | | | |
|---|---|---|---|
| 31. | Drive End Wavy Washer/Snap-Ring Other Retention Device? | **Na** | |
| 32. | Drive End Bearing Condition | **contamination** | |
| 33. | Opposite Drive End Bearing Brand | **ntn** | |
| 34. | Opposite Drive End Bearing Number- | **6208z** | |
| 35. | Opposite Drive End Bearing Qty. | **1** | |
| 36. | Opposite Drive End Bearing Type | **(Ball) Ball Bearing** | P106 |

| | | |
|---|---|---|
| 37. | Opposite Drive End Lubrication Type | **(Grease) Grease Lubricated** |
| 38. | Opposite Drive End Bearing Insulation or Grounding Device? | **no** |
| 39. | Opposite Drive End Wavy Washer/Snap-Ring Other Retention Device? | **no** |
| 40. | Opposite Drive End Bearing Condition | **contamination. grease** |
| 41. | Drive End Seal | **yes** |
| | ***Dust seal on DE*** | |
| 42. | Opposite Drive End Seal | **no** |

## Rotor Inspection

| | | |
|---|---|---|
| 43. | Rotor Type/Material | **(Squirrel Aluminum) Squirrel Cage Aluminum Die Cast** |
| 44. | Growler Test | **(Pass) Pass** |
| 45. | Number of Rotor Bars | **28** |
| 46. | Rotor Condition | |
| | ***Pass*** | |
| 47. | List the Parts needed for the Repair Below | |
| | ***1-62092z. 1-62082z*** | |
| 48. | Signature of Technician that Disassembled Motor | |

***Witness: Trh***

## Mechanical Fits- Rotor

| | | |
|---|---|---|
| 49. | Shaft Runout | **0.002 inches** |
| 50. | Rotor Runout | |

| | | |
|---|---|---|
| Drive End Bearing Fit | Rotor Body | Opposite Drive End Bearing |

51. Coupling Fit Closest to Bearing Housing

| 0 Degrees | 90 Degrees | 120 Degrees |
|---|---|---|

52. Coupling Fit Closest to the end of the Shaft

| 0 Degrees | 60 Degrees | 120 Degrees |
|---|---|---|

53. Drive End Bearing Shaft Fit

| 0 Degrees | 60 Degrees | 120 Degrees |
|---|---|---|
| **1.7673** | **1.7662** | **1.7671** |

*Worn lip*

54. Drive End Bearing Shaft Fit Condition **(F) Fail**

55. Opposite Drive End Bearing Shaft Fit

| 0 Degrees | 60 Degrees | 120 Degrees |
|---|---|---|
| **1.5748** | **1.5749** | **1.575** |

56. Opposite Drive End Bearing Shaft Fit Condition **(P) Pass**

57. Shaft Air Seal Fits

| Drive End Air Seal | Opposite Drive End Air Seal |
|---|---|

*Na*

## Mechanical Fits- Bearing Housings

58. Drive End - Endbell Bearing Fit

| 0 Degrees | 60 Degrees | 120 Degrees |
|---|---|---|

*Worn lip.*

59. Drive End - Endbell Bearing Fit Condition **(F) Fail**

*Worn lip*

60. Opposite Drive End - Endbell Bearing Fit

| 0 Degrees | 60 Degrees | 120 Degrees |
|---|---|---|
| **3.1497** | **3.15** | **3.15** |

61. Opposite Drive End - Endbell Bearing Fit Condition **(P) Pass**

62. Bearing Cap Condition

| Drive End Bearing Cap | Opposite Drive End Bearing Cap |
|---|---|
| **good** | **good** |

63. End Bell Air Seal Fits

| Drive End Air Seal | Opposite Drive End Air Seal |
|---|---|

*Na*

64. List Machine Work Needed Below

***DE end shaft fit. DE end bell housing fit.***

65. Technician

*Witness TRH*

## Root Cause of Failure

66. Failure locations

***Shaft and DE housing fits bad***

67. Root cause of failure

***Contaminated grease in both housings, and DE housing fit out of tolerance. This led to premature bearing failure.***

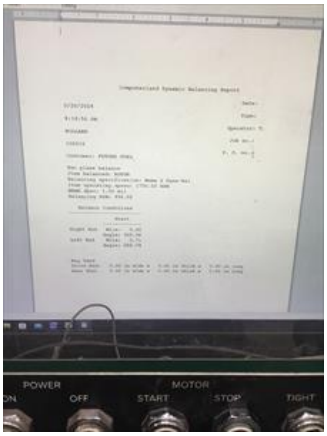
## Dynamic Balance Report

68. Rotor Weight and Balance Grade

| Rotor Weight | Balance Grade |
|---|---|
| | |

69. Initial Balance Readings P11

| Drive End | Opposite Drive End |
|---|---|
| | |




70. Final Balance Readings

| Drive End | Opposite Drive End |
|---|---|
| | |

71. Technician **Terrence Holland**

## Mechanical Fits- Rotor - Post Repair

72. Shaft Runout Post Repair **0.001 inches**

73. Rotor Runout Post Repair

| Drive End Bearing Fit | Rotor Body | Opposite Drive End Bearing |
|---|---|---|
| **0.002** | **0.002** | **0.002** |

74. Coupling Fit Closest to Bearing Housing Post Repair

| 0 Degrees | 90 Degrees | 120 Degrees |
|---|---|---|
| | | |

75. Coupling Fit Closest to the end of the Shaft Post Repair

| 0 Degrees | 60 Degrees | 120 Degrees |
|---|---|---|
| | | |

76. Drive End Bearing Shaft Fit Post Repair P49

| 0 Degrees | 60 Degrees | 120 Degrees |
|---|---|---|
| **1.7722** | **1.772** | **1.772** |

77. Opposite Drive End Bearing Shaft Fit Post Repair

| 0 Degrees | 60 Degrees | 120 Degrees |
|---|---|---|

78. Shaft Air Seal Fits Post Repair

| Drive End Air Seal | Opposite Drive End Air Seal |
|---|---|

79. Shaft Repair Sign-off **Gary**

## Mechanical Fits- Bearing Housings - Post Repair

80. Drive End - Endbell Bearing Fit Post Repair P5

| 0 Degrees | 60 Degrees | 120 Degrees |
|---|---|---|
| **3.347** | **3.347** | **3.347** |

81. Opposite Drive End - Endbell Bearing Fit Post Repair

| 0 Degrees | 60 Degrees | 120 Degrees |
|---|---|---|

82. Bearing Cap Condition Post Repair

| Drive End Bearing Cap | Opposite Drive End Bearing Cap |
|---|---|

83. End Bell Air Seal Fits Post Repair

| Drive End Air Seal | Opposite Drive End Air Seal |
|---|---|

84. End Bell Repair Sign-off **Gary**

## Assembly

85. QC Check All Parts for Cleanliness Prior to Assembly **Terrence Holland**

86. Photograph All Major Components prior to assembly P17

*Overload ohms*

| | | | | |
|---|---|---|---|---|
| 87. | Final Insulation Resistance Test | | | |
| 88. | Assembled Shaft Endplay | | | |
| 89. | Assembled Shaft Runout | | | |
| 90. | Test Run Voltage | | | P56 |
| | Volts | Volts | Volts | |



*Leads 1,2,3*
*4,5,6 open*

*4,5,6 line*
*1,2,3 tied*

| | | | | |
|---|---|---|---|---|
| 91. | Test Run Amperage | | | P65 |
| | Amps | Amps | Amps | |



92. Drive End Vibration Readings - Inches Per Second

| Horizontal | Vertical | Axial |
|---|---|---|
| **0.05** | **0.04** | |

93. Opposite Drive End Vibration Readings - Inches Per Second

| Horizontal | Vertical | Axial |
|---|---|---|
| **0.05** | **0.06** | **0.1** |

94. Ambient Temperature - Fahrenheit

95. Drive End Bearing Temps - Fahrenheit

| 5 Minutes | 10 Minutes | 15 Minutes |
|---|---|---|

96. Opposite Drive End Bearing Temps - Fahrenheit

| 5 Minutes | 10 Minutes | 15 Minutes |
|---|---|---|

97. Document Final Condition with Pictures after paint

98. Final Pics and QC Review **Terrence Holland** P131

*Witness:*