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

# DC Repair Report

**Reynolds Metals company**
**1333 highway 270**
**Malvern, AR 72104**

FolderID: 103617
FormID: 21895446

**DC Repair Report Rev. 2**

| | |
|---|---|
| **Location:** | LITTLE ROCK MOTOR SHOP |
| **Job Number:** | 103617 |
| **Serial Number:** | CR-1-473CR |
| **Description:** | 100HP GENERAL ELECTRIC |

| | |
|---|---|
| **Hi-Speed Job Number:** | 103617 |
| **Manufacturer:** | US Motors/Nidec |
| **Product Number :** | M: 5CD203PA007A808 |
| **Serial Number:** | CR-1-473CR |
| **HP/KW:** | 100 (HP) |
| **RPM:** | 17502100 |
| **Armature Voltage:** | 500 (Volts) |
| **Armature Current:** | 161 (Amps) |
| **Field Voltage:** | 240 (Volts) |
| **Field Current :** | 3.7 (Amps) |
| **J-Box Included:** | No |
| **Date Received:** | 10/10/2024 |
| **Bearing RTDS:** | No |
| **Winding RTDS:** | No |
| **Mounting Orientation :** | Horizontal |

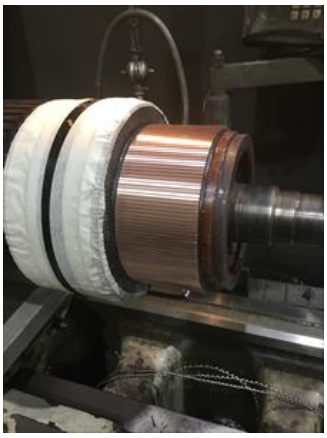
Priorities Found: **2 - High** **8 - Good**

## Overall Condition

1. Describe the Overall Condition of the Equipment as Received

   ***Serviceable***

2. Nameplate Picture P17

*Turned and polished com.*
*Gary*

*Installed Agis ring.*
*Gary*

| | | | |
|---|---|---|---|
| | 3. | Distance From the End of the Shaft to the end of the Face of the Sheave/Coupling | **0** P31 |

## Initial Mechanical/Electrical

| | | | |
|---|---|---|---|
| 🔴 | 4. | Does the Shaft Turn Freely? | **(N) No** |
| 🟢 | 5. | Does Shaft Have Visible Damage? | **(No) No** |
| | 6. | Assembled Shaft Runout | **Inches** |
| | | ***Unable to perform due to shaft not rotating smoothly*** | |
| | 7. | Assembled Shaft End Play | **0 Inches** |

| | | | |
|---|---|---|---|
| | 8. | Air Gap Variation <10% | |
| ● | 9. | Lead Condition | **(P) Pass** |
| | 10. | Lead Length | |
| ● | 11. | Frame Condition | **(P) Pass** |
| | 12. | Fan Condition | |
| | 13. | Brush Information | P87 |

| Brush Number | Quantity | Condition |
|---|---|---|
| **T563A164451ABP** | **8** | **some wear** |

*Two different kinds of brushes in motor*

| | | | |
|---|---|---|---|
| | 14. | Brush Holder Condition - Verify proper gap to Commutator | **pass** |

## Incoming Electrical Test

| | | | |
|---|---|---|---|
| | 15. | General Condition of the Armature/Commutator | P6 |

*Dirty. Comm has some wear.*

16. Armature Insulation Resistance to Ground **7.79 Gigohms** P19


17. Field Circuit Insulation Resistance to Ground **Megohms** P30


18. Interpole Circuit Insulation Resistance to Ground **477 Gigohms** P46


19. Total Field Ohms P60


20. Field Ohms

| Between F1/F2 | Between F3/F4 |
|---|---|

21. MegOhms between Fields and Series P83


22. Series Drop Test 1&2

| Series 1 | Series 2 |
|---|---|
| **17** | **17** |

23. Series Drop Test 3&4

| Series 3 | Series 4 |
|---|---|
| **17** | **18** |

24. Field Drop Test Fields 1&2

| Total AC Voltage | Field #1 | Field #2 |
|---|---|---|
| **120** | **0.702** | **0.782** |

25. Field Drop Test Fields 3&4

| Field #3 | FIeld #4 |
|---|---|
| **0.286** | **0.783** |

26. Field Drop Test Fields 5&6

| Field #5 | FIeld #6 |
|---|---|

27. Field Drop Test Fields 7&8

| Field #7 | FIeld #8 |
|---|---|

| | | | | |
|---|---|---|---|---|
| 28. | Interpole Drop Test 1&2 | | | |
| | Total AC Voltage | Interpole #1 | Interpole #2 | |
| | | **17** | **17** | |
| 29. | Interpole Drop Test 3&4 | | | |
| | Interpole #3 | Interpole #4 | | |
| | **17** | **18** | | |
| 30. | Interpole Drop Test 5&6 | | | |
| | Interpole #5 | Interpole #6 | | |
| 31. | Interpole Drop Test 7&8 | | | |
| | Interpole #7 | Interpole #8 | | |
| 32. | Armature Number of Bars - Bar to Bar Test | | | |
| | Number of Bars | Bar to Bar Test | | |
| | | **pass** | | |

## Mechanical Inspection

| | | |
|---|---|---|
| 33. | Shaft Runout Drive End | **0.002 inches** |
| 34. | Shaft Runout Armature | |
| | Drive End Bearing Journal / Armature Core / ODE Bearing Journal | |
| 35. | Drive End Bearing Number | **6214** |
| 36. | Drive End Bearing Quantity | **1** |
| 37. | Drive End Bearing Type | **(Ball) Ball Bearing** |
| 38. | Drive End Lubrication Type | **(Grease) Grease Lubricated** |
| 39. | Drive End Bearing Insulation or Grounding Device? | |
| | ***None*** | |
| 40. | Drive End Wavy Washer/Snap-Ring Other Retention Device? | **snap ring** |
| 41. | Drive End Bearing Condition | P79 |
| | ***Contaminated grease and frosting*** | |

| | | |
|---|---|---|
| 42. | Opposite Drive End Bearing Number | **6212** |
| 43. | Opposite Drive End Bearing Quantity | **1** |
| 44. | Opposite Drive End Bearing Type | **(Ball) Ball Bearing** |
| 45. | Opposite Drive End Lubrication Type | **(Grease) Grease Lubricated** |
| 46. | Opposite Drive End Bearing Insulation or Grounding Device? | |
| | ***None*** | |

| | | |
|---|---|---|
| 47. | Opposite Drive End Wavy Washer/Snap-Ring Other Retention Device? | **wavy washer** |
| 48. | Opposite Drive End Bearing Condition | P114 |

| | | |
|---|---|---|
| 49. | Signature of Technician who Performed Teardown | **Terrence Holland** |

50. List Parts Needed Prior to Reassembly

***Aegis ring, insulated 6212 bearing, 8 sets of brushes.***

## Mechanical Fits - Armature

51. Coupling Fit Closest to Bearing Housing

| 0 Degrees | 60 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 |
|---|---|---|
| **2.7556** | **2.7555** | **2.7555** |

***Bearing slid off by hand.***

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

55. Opposite Drive End Bearing Shaft Fit

| 0 Degrees | 60 Degrees | 120 Degrees |
|---|---|---|
| **2.3627** | **2.3627** | **2.3628** |

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

57. Shaft Air Seal Fits

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

## Mechanical Fits- Bearing Housings

58. Drive End - End Bell Bearing Fit

| 0 Degrees | 60 Degrees | 120 Degrees |
|---|---|---|
| **2.7563** | **2.7565** | **2.7564** |

| | | |
|---|---|---|
| 59. | Drive End - Endbell Bearing Fit Condition | **(P) Pass** |

60. Opposite Drive End - End Bell Bearing Fit

| 0 Degrees | 60 Degrees | 120 Degrees |
|---|---|---|
| **2.3628** | **2.3627** | **2.3628** |

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

62. Bearing Cap Condition P48

| Drive End | Opposite Drive End |
|---|---|
| **pass** | |

63. End Bell Air Seal Fits

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

64. List any Machine work Needed Below **repair DE bearing shaft fit**

***1) Repair DE. bearing shaft fit.***
***2) Install aegis ring on drive end housing***

65. Signature of Technician Performing Measurements **Terrence Holland**

## Root Cause of Failure

66. Failure Locations

***Motor fields show disproportionate ohm readings during drop test.***
***DE shaft bearing journal is too small.***
***Both bearings show signs of electrical discharge damage.***

67. Root Cause of Failure

***Electrical failure of fields.***

## Commutator Data

68. Total Copper Segment Length **inches**

69. Number of Bars **159**

70. Number of Wires Per Copper Bar and Size

| Number of Wires per Bar | Wire Size |
|---|---|
| | |

71. Equalizers per Copper Bar and Equalizer Wire Size

| Equalizers per Bar | Wire Size |
|---|---|
| | |

72. Document Commutator Diameter, Minimum and Max

| Current Comm Diameter | Minimum Comm Diameter | Maximum Comm Diameter |
|---|---|---|
| | | |

73. Commutator Shaft Diameter

| Front Shaft Diameter | Back Shaft Diameter |
|---|---|
| | |

74. Commutator Type

75. Commutator Bore

76. Signature of Technician Recording Data

## Dynamic Balance Report

77. Rotor Weight and Balance Grade

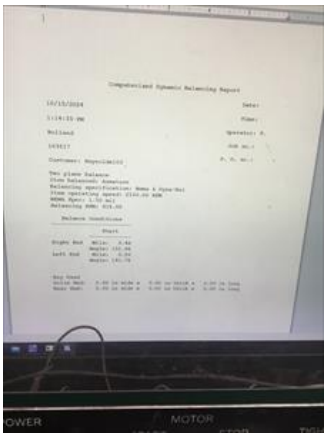
| Rotor Weight | Balance Grade |
|---|---|
| | |

78. Initial Balance Readings

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

79. Final Balance Readings P27

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



80. Signature of the Balance Technician **Terrence Holland**

## Post Armature Rewind Testing

81. Post Rewind Armature Insulation Resistance to Ground **Megohms**

82. Post Rewind Field Circuit Measure the Insulation Resistance to Ground **Megohms**

83. Post Rewind Armature Number of Bars - Bar to Bar Test

| Number of Bars | Bar to Bar Test |
|---|---|

84. Post Rewind Field Circuit Insulation Resistance to Ground **Megohms**

85. Post Rewind Interpole Circuit Insulation Resistance to Ground **Megohms**

86. Post Rewind Field Drop Test Fields 1&2

| Total AC Voltage | Field #1 | Field #2 |
|---|---|---|

87. Post Rewind Field Drop Test Fields 3&4

| Field #3 | FIeld #4 |
|---|---|

88. Post Rewind Field Drop Test Fields 5&6

| Field #5 | FIeld #6 |
|---|---|

89. Post Rewind Field Drop Test Fields 7&8

| Field #7 | FIeld #8 |
|---|---|

90. Post Rewind Interpole Drop Test 1&2

| Total AC Voltage | Interpole #1 | Interpole #2 |
|---|---|---|

91. Post Rewind Interpole Drop Test 3&4

| Interpole #3 | Interpole #4 |
|---|---|

92. Post Rewind Interpole Drop Test 5&6

| Interpole #5 | Interpole #6 |
|---|---|

93. Post Rewind Interpole Drop Test 7&8

| Interpole #7 | Interpole #8 |
|---|---|

## Post Mechanical Repair

94. Post Repair Coupling Fit Closest to Bearing Housing

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

95. Post Repair Coupling Fit Closest to the End of the Shaft

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

96. Post Repair Drive End Bearing Shaft Fit

| 0 Degrees | 60 Degrees | 120 Degrees |
|---|---|---|
| **2.7566** | **2.7565** | **2.7565** |

97. Post Repair Drive End Bearing Shaft Fit Condition **(P) Pass** P38

98. Post Repair Drive End Opposite Drive End Bearing Shaft Fit

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

99. Post Repair Drive End Opposite Drive End Bearing Shaft Fit Condition

100. Post Repair Drive End - End Bell Bearing Fit

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

101. Post Repair Drive End - Endbell Bearing Fit Condition

102. Post Repair Opposite Drive End - End Bell Bearing Fit

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

103. Post Repair Opposite Drive End - Endbell Bearing Fit Condition

104. Post Repair Bearing Cap Condition

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

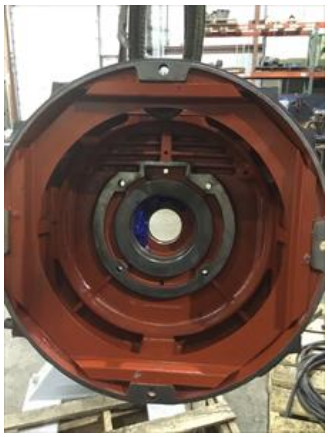
105. Post Repair End Bell Air Seal Fits

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

106. Signature of Tech Performing Mechanical Repairs **Gary**

## Assembly

107. Take Pictures of all Major Components Prior to Reassembly P7



| | | | |
|---|---|---|---|
| 108. | Verify Brush Box Holders Have the Proper Clearance, and Brushes have been Seated Properly | | **(P) Pass** |
| 109. | Assembled Shaft End Play and Runout | | |
| | Shaft Endplay | Shaft Runout | |
| | **0** | **.002** | |
| 110. | Perform No-Load Test Run, Record Armature Voltage and Current | | P43 |
| | Voltage | Current | |

*Meg armature and inter poles*

*Series*

*Fields*

*Arm& Inter poles @ 2500*

*Series @ 2500*

*Fields @ 2500*

111. Perform No-Load Test Run, Record Field Voltage and Current

| Voltage | Current |
|---|---|

*See above*

112. Document Vibration Readings Drive End

| Horizontal | Vertical | Axial |
|---|---|---|

113. Document Vibration Readings Opposite Drive End

| Horizontal | Vertical | Axial |
|---|---|---|

114. Perform Full-Load Test Run, Record Armature Voltage and Current P78

| Voltage | Current |
|---|---|


115. Perform Full-Load Test Run, Record Field Voltage and Current

| Voltage | Current |
|---|---|

*See above:*

116. Document Vibration Readings Under Full Load Drive End

| Horizontal | Vertical | Axial |
|---|---|---|

117. Document Vibration Readings Under Full Load Opposite Drive End

| Horizontal | Vertical | Axial |
|---|---|---|

118. Ambient Temperature **Fahrenheit**

119. Drive End Bearing Temps Under Full Load

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

120. Opposite Drive End Bearing Temps Under Full Load

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

121. Final Test Run Sign-Off **Terrence Holland** P113

*Co sign: RRW*


122. Document Final Condition With Pictures P116

123. Final QC Sign-Off **Terrence Holland**