

FolderID: 103786 FormID: 22331681

**DC Repair Report** 

**Reynolds Metals company** 1333 highway 270

Malvern, AR 72104

| DC Repair Rep                      | ort Rev. 2             | Hi-Speed Job Number:   | 103786             |  |
|------------------------------------|------------------------|------------------------|--------------------|--|
| Location:                          | LITTLE ROCK MOTOR SHOP | Manufacturer:          | GE                 |  |
|                                    |                        | Product Number :       | M: 5CD203PA032A014 |  |
| Job Number:                        | 103786                 | Serial Number:         | JU-1-356-JU        |  |
| Serial Number:                     | JU-1-356-JU            | HP/KW:                 | 100 (HP)           |  |
| Status:                            | In need of Repair      | RPM:                   | 17502100           |  |
| Description:100HP GE 1750/2100 RPM |                        | Armature Voltage:      | 500 (Volts)        |  |
|                                    |                        | Armature Current:      | 160 (Amps)         |  |
|                                    |                        | Field Voltage:         | 300 (Volts)        |  |
|                                    |                        | Field Current :        | 3.0 (Amps)         |  |
|                                    |                        | J-Box Included:        | No                 |  |
|                                    |                        | Bearing RTDS:          | No                 |  |
|                                    |                        | Winding RTDS:          | No                 |  |
|                                    |                        | Mounting Orientation : | Horizontal         |  |

Priorities Found: **2 - High** 

### **Overall Condition**

Describe the Overall Condition of the Equipment as Received 1. Serviceable

7 - Good

2. Nameplate Picture





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Brush holder to frame









3. Distance From the End of the Shaft to the end of the Face of the Sheave/Coupling

## Initial Mechanical/Electrical

4. Does the Shaft Turn Freely?

(Y) Yes

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| • | 5.   | Does Shaft Have Visible Damage?                    | (No) No             | P22 |
|---|------|--|---------------------|-----|
|   | 6.   | Assembled Shaft Runout                             | 0.002 Inches        |     |
|   | 7.   | Assembled Shaft End Play                           | 0 Inches            |     |
|   | 8.   | Air Gap Variation <10%                             |                     |     |
|   | 9.   | Lead Condition                                     | (F) Fail            | P55 |
|   | Brat | Tead lag connections have some broken wire strands |                     |     |
|   | 10.  | Lead Length  | 10 Inches           |     |
|   | 11.  | Frame Condition                                    | (P) Pass            |     |
|   | 12.  | Fan Condition                                      | (NA) Not Applicable |     |

|     | Brush springs and holders were re | moved from the motor and were in plas | tic bags inside the ODF housing |
|-----|-----------------------------------|---------------------------------------|---------------------------------|
|     | T563 36A164451ABP18               | 8                                     | new                             |
|     | Brush Number                      | Quantity                              | Condition                       |
| 13. | Brush Information                 |                                       |                                 |
|     |                                   |                                       |                                 |





14. Brush Holder Condition - Verify proper gap to Commutator
*Disconnected by previous technician.*

# **Incoming Electrical Test**

15. General Condition of the Armature/Commutator



brush holders serviceable

needs polished

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|        | Between F1/F2                | Between F3/F4 |
|--------|------------------------------|---------------|
|        | 8.5                          | 15.4          |
|        |                              |               |
| 21.    | MegOhms between Fields and S | P83           |
| Ø AEMC |                              |               |
| 22.    | Series Drop Test 1&2         |               |
|        | Series 1                     | Series 2      |
|        |                              |               |
| -      | Fields require rewind        |               |
| 23.    | Series Drop Test 3&4         |               |
|        | Series 3                     | Series 4      |
| 0.4    | Field Dress Test Fields 400  |               |
| 24.    | Field Drop Test Fields 1&2   |               |
|        |                              |               |
| 05     | SU                           | 0.104 0.124   |
| 25.    | Field Drop Test Fields 3&4   |               |
|        |                              |               |
|        | 0.169                        | 0.266         |
| 26.    | Field Drop Test Fields 5&6   |               |
|        | Field #5                     | Field #6      |
|        |                              |               |
| 27.    | Field Drop Test Fields 7&8   |               |
|        | Field #/                     | Field #8      |

20. Field Ohms

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| 28.   | Interpole Drop Test 1&2   |                              |  |     |
|---|---|------------------------------|--|-----|
|   | Total AC Voltage  | Interpole #1                 | Interpole #2   |     |
|   | 28  | 18.19                        | 14.28  |     |
| 29.   | Interpole Drop Test 3&4   |                              |  |     |
|   | Interpole #3  | Interpole #4                 |  |     |
|   | 16.75   | 17.47                        |  |     |
| 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 t   | o Bar Test                   |  |     |
|   | Number of Bars  | Bar to Bar Test              |  |     |
|   | 159   |                              |  |     |
| Mecha   | anical Inspection   |                              |  | O   |
| 33.   | Shaft Runout Drive End  |                              | 0.002 inches   |     |
| 34.   | Shaft Runout Armature   |                              |  |     |
|   | Drive End Bearing Journal   | Armature Core                | ODE Bearing Journal  |     |
|   | <b>J</b>  |                              |  |     |
|   | 0.002   |                              |  |     |
| 35.   | 0.002<br>Unable to perform armature core r                              | runout due to excessive amou | nts of melted insulation on its surface.<br>6214 2Z/C3   | P28 |
| 35.   | 0.002<br>Unable to perform armature core of<br>Drive End Bearing Number | runout due to excessive amou | <section-header><section-header></section-header></section-header>   | P28 |
| 35.<br><b>1</b>                               | 0.002<br>Unable to perform armature core of<br>Drive End Bearing Number | runout due to excessive amou | <section-header><section-header><section-header><section-header><section-header></section-header></section-header></section-header></section-header></section-header>  | P28 |
| 35.<br>35.<br>36.<br>37.                      | 0.002<br>Unable to perform armature core of<br>Drive End Bearing Number | runout due to excessive amou | nts of melted insulation on its surface.<br>6214 2Z/C3   | P28 |
| 35.<br>35.<br>36.<br>37.<br>38.               | 0.002<br>Unable to perform armature core of<br>Drive End Bearing Number | runout due to excessive amou | nts of melted insulation on its surface.<br>6214 2Z/C3   | P28 |
| 35.<br>35.<br>36.<br>37.<br>38.<br>39.        | 0.002<br>Unable to perform armature core of<br>Drive End Bearing Number | runout due to excessive amou | nts of melted insulation on its surface.<br>6214 2Z/C3   | P28 |
| 35.<br>35.<br>36.<br>37.<br>38.<br>39.<br>40. | 0.002<br>Unable to perform armature core of<br>Drive End Bearing Number | Funout due to excessive amou | nts of melted insulation on its surface.<br>6214 2Z/C3<br>The second state of the second sta | P28 |

#### 42. Opposite Drive End Bearing Number

6213 2Z/C3

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| N | Mechanical Fits- Bearing Housings |                                   |                     |             |     |
|---|-----------------------------------|-----------------------------------|---------------------|-------------|-----|
|   | 58.                               | Drive End - End Bell Bearing Fit  |                     |             |     |
|   |                                   | 0 Degrees                         | 60 Degrees          | 120 Degrees |     |
|   |                                   | 4.921                             | 4.921               | 4.9212      |     |
|   | •                                 | Needs polishing.                  |                     |             |     |
|   | 59.                               | Drive End - Endbell Bearing Fit C | ondition            | (F) Fail    |     |
|   | •                                 | Needs polishing.                  |                     |             |     |
|   | 60.                               | Opposite Drive End - End Bell Be  | aring Fit           |             |     |
|   |                                   | 0 Degrees                         | 60 Degrees          | 120 Degrees |     |
|   |                                   | 4.7348                            | 4.7248              | 4.7250      |     |
|   | 61.                               | Opposite Drive End - Endbell Bea  | aring Fit Condition | (P) Pass    |     |
|   | 62.                               | Bearing Cap Condition             |                     |             | P48 |
|   |                                   | Drive End                         | Opposite Drive End  |             |     |
|   |                                   | pass                              | pass                |             |     |





0.D.E.

| D.E. |                                | D.E.   |                  |
|------|--------------------------------|--|------------------|
| 63.  | End Bell Air Seal Fits         |  |                  |
|      | Drive End Air Seal             | Opposite Drive End Air Seal                  |                  |
|      |                                |  |                  |
| 64.  | List any Machine work Need     | ed Below                                     |                  |
|      | D.E housing fit needs polishin | g with course scotch-brite. Verified by macl | hinist           |
| 65.  | Signature of Technician Perf   | orming Measurements                          | Terrence Holland |

400-

Co sign: CRW

## **Root Cause of Failure**

### 66. Failure Locations

Total rewind of fields and inter poles due to excessive amounts of heat generated which melted insulation inside the stator.











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| 67.    | Root Cause of Failure                |                                       |                       |  |  |  |
|--------|--------------------------------------|---------------------------------------|-----------------------|--|--|--|
|        | Un determined.                       |                                       |                       |  |  |  |
| Comm   | Commutator Data                      |                                       |                       |  |  |  |
| 68.    | Total Copper Segment Length          |                                       | 3.937 inches          |  |  |  |
|        | 3 15/16"                             |                                       |                       |  |  |  |
| 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 Ec     | ualizer 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    | g Data                                |                       |  |  |  |
| Dynam  | nic 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               |                                       |                       |  |  |  |
|        | Drive End Readings                   | Opposite Drive End Readings           |                       |  |  |  |
|        |                                      |                                       |                       |  |  |  |
| 80.    | Signature of the Balance Technicia   | an                                    |                       |  |  |  |
| Post A | rmature Rewind Testing               |                                       |                       |  |  |  |
| 81.    | Post Rewind Armature Insulation I    | Resistance to Ground                  |                       |  |  |  |
| 82.    | Post Rewind Field Circuit Measure    | e the Insulation Resistance to Ground |                       |  |  |  |
| 83.    | Post Rewind Armature Number of       | Bars - Bar to Bar Test                |                       |  |  |  |
|        | Number of Bars                       | Bar to Bar Test                       |                       |  |  |  |
|        |                                      |                                       |                       |  |  |  |
| 84.    | Post Rewind Field Circuit Insulation | on Resistance to Ground               |                       |  |  |  |
| 85.    | Post Rewind Interpole Circuit Insu   | lation Resistance to Ground           |                       |  |  |  |
| 86.    | Post Rewind Field Drop Test Field    |                                       | <b>F</b> : 11 #0      |  |  |  |
|        | I otal AC Voltage                    | Field #1                              | Field #2              |  |  |  |
|        |                                      |                                       |                       |  |  |  |
| 87.    | Post Rewind Field Drop Test Field    | IS 3&4                                |                       |  |  |  |
|        | Field #3                             | Field #4                              |                       |  |  |  |
|        |                                      |                                       |                       |  |  |  |

| 88.    | Post Rewind Field Drop Test Field  | ds 5&6                                |              |  |
|--------|------------------------------------|---------------------------------------|--------------|--|
|        | Field #5                           | Fleld #6                              |              |  |
|        |                                    |                                       |              |  |
| 89.    | Post Rewind Field Drop Test Field  | ds 7&8                                |              |  |
|        | Field #7                           | Fleld #8                              |              |  |
|        |                                    |                                       |              |  |
| 90.    | Post Rewind Interpole Drop Test    | 1&2                                   |              |  |
|        | Total AC Voltage                   | Interpole #1                          | Interpole #2 |  |
| 01     | Post Powind Internale Drop Test    | 284                                   |              |  |
| 91.    | Interpole #3                       | Internole #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 M | echanical Repair                   |                                       |              |  |
| 94.    | Post Repair Coupling Fit Closest   | to Bearing Housing                    |              |  |
|        | 0 Degrees                          | 60 degrees                            | 120 degrees  |  |
| 05     |                                    |                                       |              |  |
| 95.    | Post Repair Coupling Fit Closest   | 60 degrees                            | 120 degrees  |  |
|        | 0 Degrees                          | ou degrees                            | 120 degrees  |  |
| 96.    | Post Repair Drive End Bearing St   | naft Fit                              |              |  |
|        | 0 Degrees                          | 60 Degrees                            | 120 Degrees  |  |
|        |                                    |                                       |              |  |
| 97.    | Post Repair Drive End Bearing Sh   | naft Fit Condition                    |              |  |
| 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 - Endhell F  | Rearing Fit Condition                 |              |  |
| 101.   | 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  | n                                     |              |  |
|        | Drive End                          | Opposite Drive End                    |              |  |
|        |                                    |                                       |              |  |
| 105.   | Post Repair End Bell Air Seal Fits |                                       |              |  |
|        | Drive End Air Seal                 | Opposite Drive End Air Seal           |              |  |

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| 106.  | Signature of Tech Performing Me                               | echanical Repairs                 |             |  |  |  |
|-------|---|-----------------------------------|-------------|--|--|--|
| Assem | Assembly  |                                   |             |  |  |  |
| 107.  | 07. Take Pictures of all Major Components Prior to Reassembly |                                   |             |  |  |  |
| 108.  | Verify Brush Box Holders Have t<br>have been Seated Properly  | he Proper Clearance, and Brushes  |             |  |  |  |
| 109.  | Assembled Shaft End Play and F                                | Runout                            |             |  |  |  |
|       | Shaft Endplay   | Shaft Runout                      |             |  |  |  |
|       |   |                                   |             |  |  |  |
| 110.  | Perform No-Load Test Run, Rec                                 | ord Armature Voltage and Current  |             |  |  |  |
|       | Voltage   | Current                           |             |  |  |  |
|       |   |                                   |             |  |  |  |
| 111.  | Perform No-Load Test Run, Rec                                 | ord Field Voltage and Current     |             |  |  |  |
|       | Voltage   | Current                           |             |  |  |  |
|       |   |                                   |             |  |  |  |
| 112.  | Document Vibration Readings D                                 | rive End                          |             |  |  |  |
|       | Horizontal  | Vertical                          | Axial       |  |  |  |
| 440   |   |                                   |             |  |  |  |
| 113.  | Document Vibration Readings O                                 | pposite Drive End                 | A *-1       |  |  |  |
|       | Horizontal  | ventical                          | Axiai       |  |  |  |
| 114   | Perform Full-Load Test Run Red                                | cord Armature Voltage and Current |             |  |  |  |
|       | Voltage   | Current                           |             |  |  |  |
|       |   |                                   |             |  |  |  |
| 115.  | Perform Full-Load Test Run, Red                               | cord Field Voltage and Current    |             |  |  |  |
|       | Voltage   | Current                           |             |  |  |  |
|       |   |                                   |             |  |  |  |
| 116.  | Document Vibration Readings U                                 | nder Full Load Drive End          |             |  |  |  |
|       | Horizontal  | Vertical                          | Axial       |  |  |  |
|       |   |                                   |             |  |  |  |
| 117.  | Document Vibration Readings U                                 | nder Full Load Opposite Drive End |             |  |  |  |
|       | Horizontal  | Vertical                          | Axial       |  |  |  |
| 110   | Ambient Temperature   |                                   |             |  |  |  |
| 110.  | Drive End Rearing Temps Linder                                | Full Lood                         |             |  |  |  |
| 119.  | 5 Minutes   |                                   | 15 Minutos  |  |  |  |
|       | 5 Minutes   | 10 minutes                        | 15 Millules |  |  |  |
| 120.  | Opposite Drive End Bearing Ten                                | nps Under Full Load               |             |  |  |  |
|       | 5 Minutes   | 10 Minutes                        | 15 Minutes  |  |  |  |
|       |   |                                   |             |  |  |  |
| 121.  | Final Test Run Sign-Off                                       |                                   |             |  |  |  |
| 122.  | Document Final Condition With F                               | Pictures                          |             |  |  |  |
| 123.  | Final QC Sign-Off   |                                   |             |  |  |  |