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| Work Instruction – **TI21 / ET200 Track Circuit Power Supply Replacement** | WO No.  |  |
| Date:  |  |
| Scope: |  |
| Team Leader: |  | TC Type: | TI21 / ET200 Track Circuit |
| Activity: | Replacement of Gayrad TI21 / ET200 Track Circuit Power Supply to Store 93 V4 Like for Like Renewal |
| Reference:  | PR S 47114, PR S 47115, PR S 40008, PR S 40009, PR S 40010, PR S 40011, PR S 40025, MN S 41357, GL S 43001 |
| Activity No. | Task No. | Work Description | Completed Name/Sign |
|  |  | APPARATUS INSPECTION & PREPARATION |  |
| 1 | 1A | Prior to the equipment replacement, the following measurements are to be taken (unless power supply has failed), for the track circuit/s affected and recorded in the provided track circuit history card. PSU Input, PSU Output Rx input, Measurement across 1 ohm resistor (Unoccupied). |  |
|  | 1B | Correlate wiring including a wire and null count on the existing power supply and mark on the attached circuit book sheets.If any discrepancy is found, note down in the space provided below and contact Signal Engineer.DEFECT(S): |  |
| 2 | 2A | Conduct an apparatus inspection on the new power supply and ensure it is of correct type and configuration in accordance with the equipment requirement. |  |
|  | 2B | Document the disconnection list and attach it to the work instruction. |  |
|  |  | SAFEWORKING & DISCONNECTION FROM INTERLOCKING |  |
| 3 | 3A | Ensure the affected track circuit/s is booked out of use in accordance with PR S 40008 – Booking Signalling Equipment Out of Use |  |
|  | 3B | Disconnect the track circuit/s in accordance with PR S 40009 – Disconnection of Signalling Apparatus. |  |
|  | 3C | Disconnect the power supply to be upgraded by removing the associated fuse and terminal and confirm with a multimeter. |  |
|  |  | DISCONNECTION, REMOVAL AND INSTALLATION  |  |
| 4 | 4A | Remove the wiring from the existing power supply and keep the beads intact. Isolate the earth wire and leave it on the wiring duct at the back of the rack and remove it completely at the end. |  |
|  | 4B | Carefully dismount the existing power supply from the rack and keep aside. |  |
|  | 4C | Carefully mount the new Store 93 power supply onto the rack using the conversion plate. |  |
|  | 4D | Re-terminate the wires on the new Store 93 power supply according to the wire beads and previously marked up circuit book sheets. Ensure all wires are terminated firmly and correctly. Bell test the re-terminated wires and mark up on attached circuit book sheets |  |
|  | 4E | Perform a final apparatus inspection on the newly replaced equipment and all associated wiring. |  |

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| Activity No. | Task No. | Work Description | Completed Name/Sign |
|  |  | CERTIFICATION (POWER SUPPLY) |  |
| 5 | 5A | Conduct a wire and null count on the new power supply. Record on circuit diagram. |  |
|  | 5B | Insert the fuse and terminal for the new power supply. Measure the 120VAC input at the new power supply, 24VDC output at the busbar, and record them on provided track circuit history cards. Complete the location power supply test certificate.Note: 24VDC output shall be between 24V – 28V and ensure the polarity is correct. |  |
|  |  | ADJUSTMENT AND CERTIFICATION (TRACK CIRCUIT/S) |  |
| 6 | 6A | Check the track circuit/s relay is energised and ensure a warbling tone can be heard from the transmitter. |  |
|  | 6B | Confirm that the “Power”, “Internal” and “Load” LEDs on the transmitter are all green. |  |
|  | 6C | Measure the value across the 1 ohm resistor on the receiver when the track is unoccupied and ensure the GAIN x measured value is close to 400mV.Refer – MN S 41357 |  |
|  | 6D | Conduct a Drop Shunt test at the receiver end 2 metres outside the tuned loop. The drop shunt reading should be as close as possible to 1 ohm. Compare to readings on THC.If required, make adjustments on receiver sensitivity setting. Refer – MN S 41357 |  |
|  | 6E | Conduct a Fix Shunt test at all extremities and record the values required on the track circuit history card. |  |
|  | 6F | Perform all required test and compare the values obtained with the previous values from the local track circuit history card and the normally expected values. Assess the need for readjustment and repeat procedures 6B, 6C, 6D, 6E and 6F if required. Record the final values on the provided track circuit history cards. |  |
| 7 | 7A | Check with the signaller the affected track circuit/s are operational. |  |
|  | 7B | Book the affected track circuit/s back into use. |  |
| Note: All the above values shall be measured by using the type approved and calibrated frequency selective meter where required. Values shall be recorded on testing record sheets / cards provided.

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| I certify, Track Circuit/s: |  |
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| with Power Supply S/N: |  |
|  |  |  |
| at |  | location, has been inspected, tested and certified fit for service. |

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| Print Name |  | Position |
|  |  |  |
| Signature |  | Date |

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