

GE ZENITH Controls

Perform Preventative Maintenance on an F-14	
Purpose:	To keep an F-14, with a MX 100 control panel, with in specifications.
When:	When directed by a service order.

Required Tools & Equipment:	
Basic electricians hand tools	PPE
Clamp-on ammeter	Rubber Insulating Gloves Class 0
Multimeter Digital or Analog	Safety Glasses
Lubriplate 105	Electrical hazard safety shoes
ISO Form 5-F504-C Preventive Maintenance Report Form	ISO Form 5-F506-B milliVolt Drop Test
ATS door key	Infra-red scanner

 Danger
HAZARDOUS VOLTAGE Can Cause Severe Injury or Death
Ensure before the enclosure is opened, you must lockout all energy sources to the ATS.

Do These Steps:

1. *Obtain* the following ISO forms:
 - 5-F504-C Preventive Maintenance Report Form
 - 5-F506-B milliVolt Drop Test
2. *Complete* the top section of form 5-F504-C.
3. Obtain the ATS door key.


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4. *Inspect* the outside of the cabinet for:

- Front Panel Operation
- Physical Damage
- Rust
- Corrosion
- Water Damage/Contamination
- Intact Conduit
- Operation of the Lock
- Hinges

 **Danger**

HAZARDOUS VOLTAGE
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5. *Open* the front cover. 
6. *Place* the disconnect switch to “Inhibit”.
7. *Disconnect* the J8 plug from the RT box.

Note: This will disable the automatic transfer.

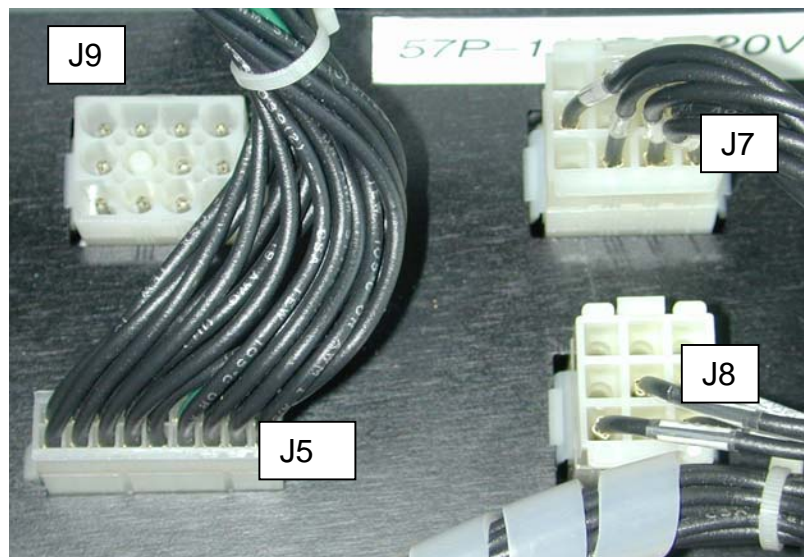


Figure 1.

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8. *Inspect* the inside of the cabinet and switch for:

Burnt lugs

Burnt contacts on the micro switch

Burnt wires

Wire Integrity, Crimps and insertion into the connectors



Figure 2.

9. *Check* the normal source voltage.
A to B, B to C, C to A.



Note: On a four pole you will need to check the neutral.

10. *Check* normal source current on each phase with a clamp-on ammeter.



Note: Typically you need to look for equal current between phases.

11. *Start* the emergency source.

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12. *Repeat* steps 9 and 10 for the emergency source.



13. *Check* the frequency of the generator set.

14. *Check* the normal current path integrity [millivolt test].



Note: You will need to use a Clamp on ammeter & DMM, or an Infra-red scanner.

15. *Connect* the J8 plug into the RT box.

16. *Place* the Engine Control Switch (ECS) into the “Auto” position.

17. *Transfer* the load to the emergency source.

18. *Perform* step 14 on the emergency side of the switch.



Note: You need to check the frequency under load.

19. *Transfer* the load to the normal source.

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20. *Disable* the generator start up by removing the grounded wire from the terminal block mounted on the DIN rail.

 **Danger**

HAZARDOUS VOLTAGE
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On systems with multiple ATS's connected to a single generator, you will need to lockout all energy sources to the ATS before continuing on.



Figure 3.

21. *Disconnect* the J8 plug from the RT box.

Note: This will disable the automatic transfer.

22. *De-energize* the Automatic Transfer Switch (ATS).

Note: You need to open the breaker on both the normal and emergency sources.

23. *Check* for loose or deteriorated connections in the bus bar and lugs.

24. *Inspect* the mounting and hardware.

25. *Check* the torque on each of the normal, emergency and line lugs to 31 ft-lbs.

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26. Lubricate the plunger and linkage with Lubriplate 105.

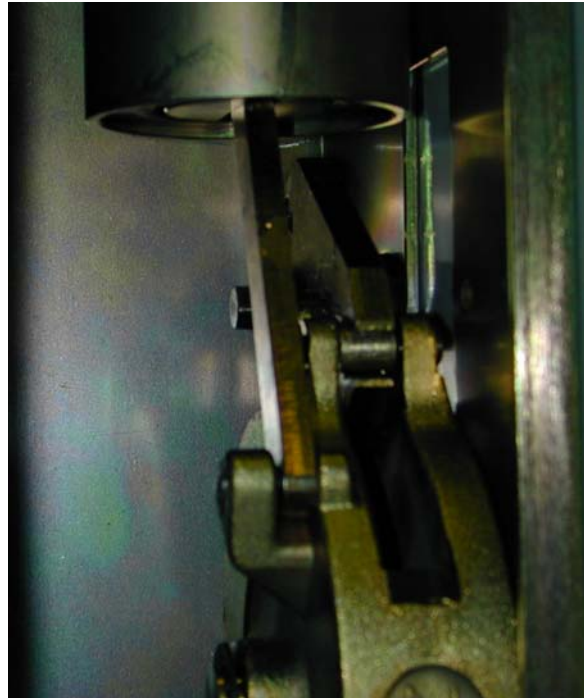


Figure 4.

27. Check the integrity of the limit switches.
SCE /SCN, SN/A4, SE/A3.



Figure 6.

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28. Check all Faston connections.

29. Check the rectifier connections.



Figure 7.

30. Remove the solenoid wires from the rectifier.

31. Check the coil's resistance.

Note: If the reading is infinite or shorted, replace the solenoid.

32. Reconnect the rectifier leads.

Note: Ensure that the solenoid lead wires are connected to the rectifier DC terminals.

33. Remove the Arc Chutes.

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34. *Inspect* the emergency contacts for a clean smooth appearance.



Figure 8.

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35. *Transfer* the switch manually.

Note: The switch should transfer smoothly through the cent 80%. The F-14 switch has a rough travel on the final 10% of travel for both normal and emergency. Any other roughness or sticking in the transfer needs to be investigated.

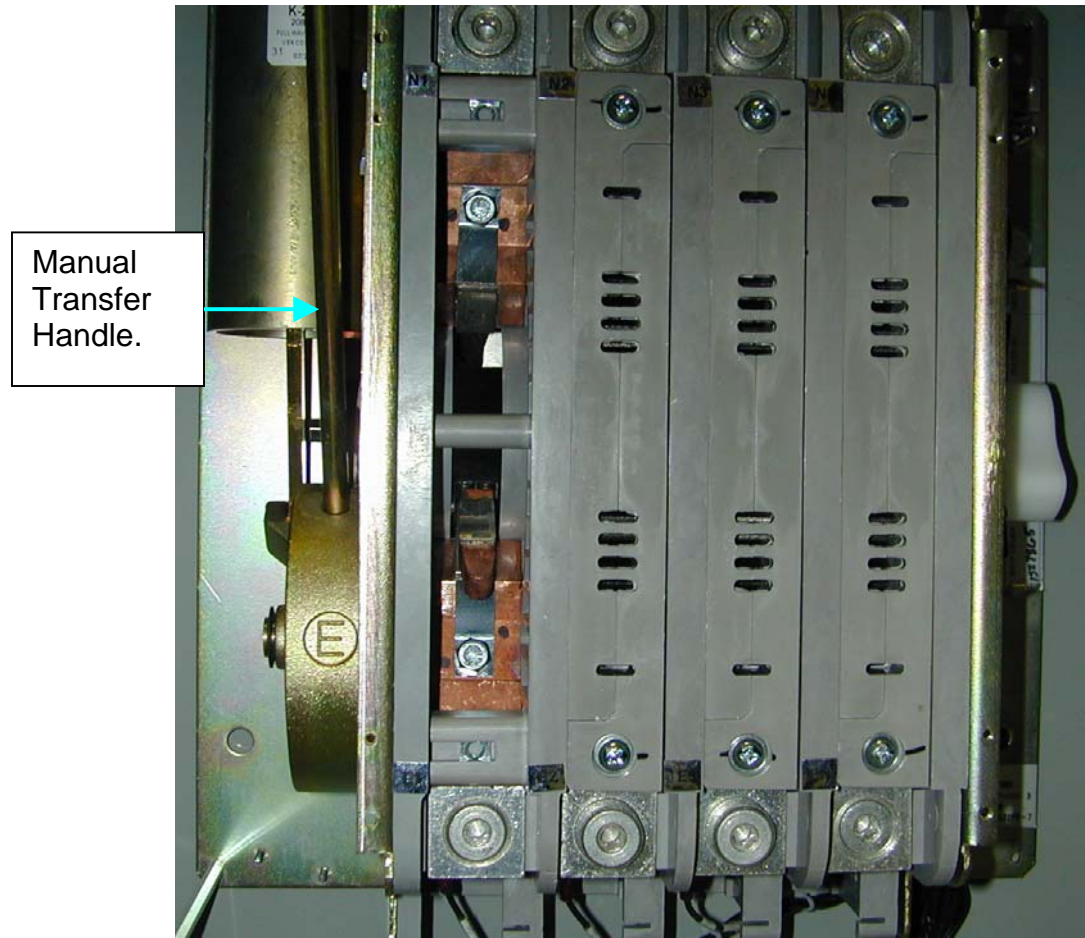


Figure 9.

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36. *Inspect* the normal contacts for a clean smooth appearance.



Figure 9.

37. *Inspect* the movable braid for damage.

38. *Transfer* the switch manually three times.

39. *Reinstall* the Arc Chutes.

40. *Reconnect* the J8 plug to the RT box.

41. *Energize* the switch.

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42. *Inspect* the Pickup and Dropout settings on the back side of the control panel.

Note: If the settings are outside the factory settings, talk to the customer to determine the setting requirements.

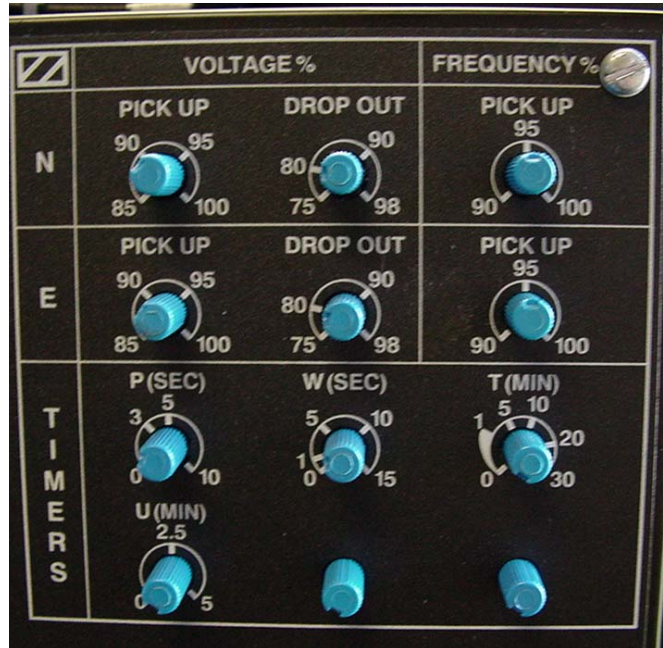


Figure 10.

43. *Disconnect* the J5, J6, and J7 plugs from the microprocessor and RT box.

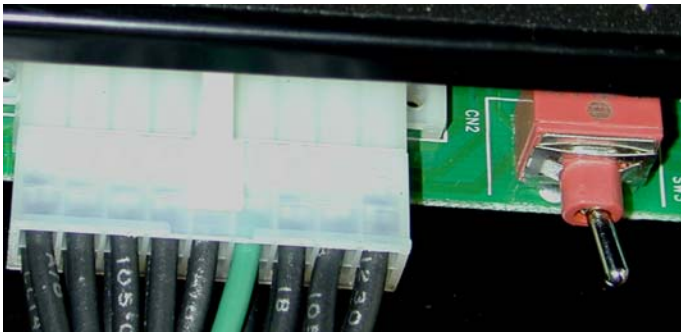


Figure 11. (J5)

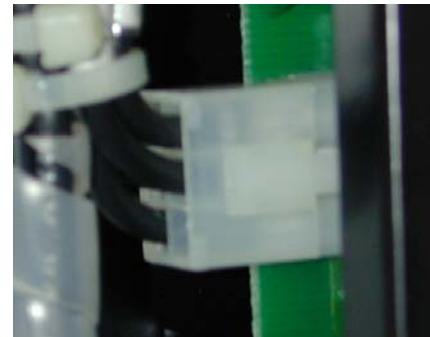


Figure 12. (J6)

44. *Inspect* the Large plug connectors for proper connections.

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45. *Inspect* the mini pin connectors for proper connections.

Note: The mini pin connectors are on J5 & J6.

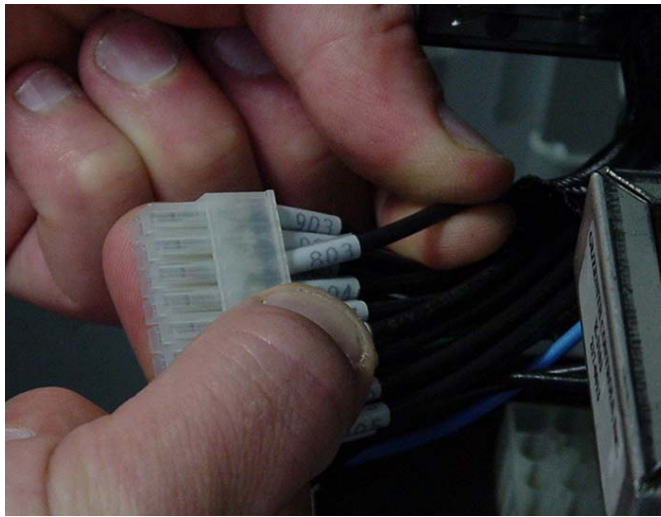


Figure 13. (J5)

46. *Remove* the RT box.

47. *Inspect* the condition of the relays.



Figure 14.

48. *Remove* the relay panel from the RT box.

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49. *Inspect* the condition of the Transformers.



Figure 15.

50. *Inspect* the condition of the wires and plugs in the RT box.

51. *Insert* the relay panel into the RT box.

52. *Install* the RT box.



Figure 16.

53. *Connect* the J5, J6, J7, and J8 plugs to the microprocessor and RT box.

54. *Replace* the 9 volt battery in the control panel.

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55. *Inspect* the din rail mounted components.

Note: If you discover any problems, replace the component.

56. *Connect* the ground wire to E11, E12 or E13 depending on the schematic.

57. *Ensure* that the “In-Phase” Monitor is in the customer desired position.

58. *Place:* the disconnect switch to Auto.

59. *Push and hold* the test pushbutton.

Note: After the time delay switch should automatically transfer to the emergency position.



Figure 17.

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60. Release the test pushbutton.

Note: Once you release the test pushbutton and after the time delay, the ATS should return to the normal position.

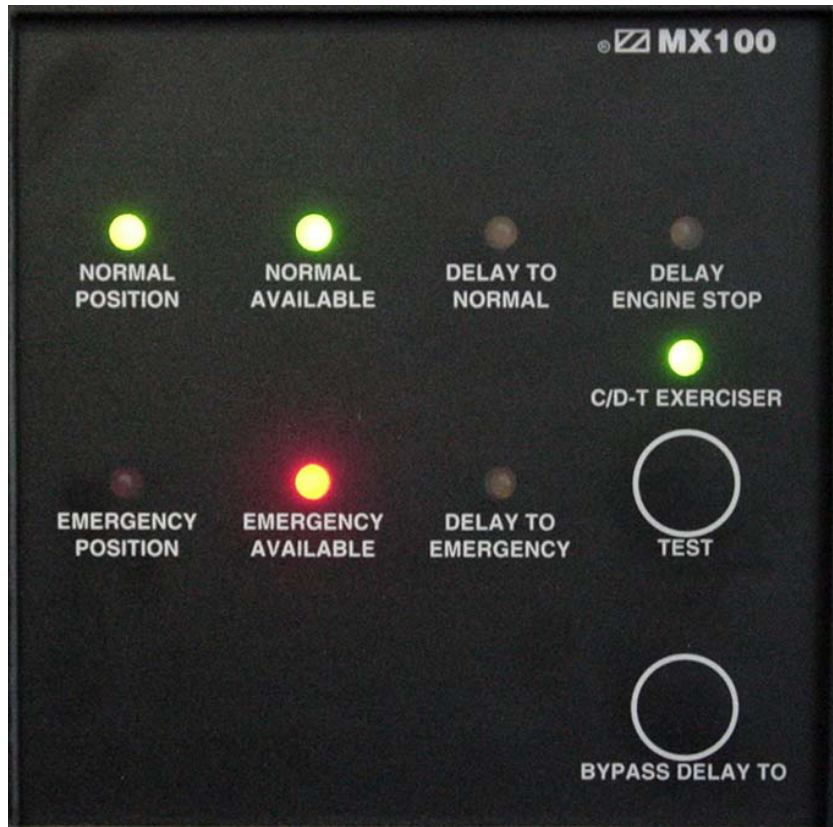


Figure 18.

61. *Clean-up* the area.

62. *Complete* the Preventive Maintenance Report.

63. *Send* Reports to GE Zenith Controls.

You know you are completed when:

- The transfer switch is secured and operating properly.
- The tools are stored.
- The reports are completed.