Controller Test Procedure

Galaxy III Complex Hydraulic Elevator Controller
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The following procedure describes the methods used to test the controller for compliance to the CAN/CSA B44-2010 code.

1. Redundancy & Monitoring in critical Circuits 2.26.93 & 2.26.94

1.1 Magnetically Operated Devices

Motor Contactor:

1-Critical Components: DEL Contactor (Across the Line Start or Wye Delta Start)
2-Redundant Components: Computer Inputs --- DEL, MCAi, MCCi
Computer Outputs --- MC, MCA
3-Circuit Conforms to 2.26.9.4: Yes
4-**Test 1**
Note: On the following tests, the car will verify the start condition three times before shutting down. Please allow sufficient time for the error condition to be tested all three times. The elevator status will show I/O Error when the test is complete.

Before the car completes a run in either direction, hold in the DEL contactor (for Across the Line Start or Wye Delta Start Applications) or hold in the C contactor (for Soft Start applications). **Alternate:** If holding in the C contactor is not achievable, then remove the wire from the P terminal on the GALX-1038N or GALX-1064N board. Observe that the car shuts down at the landing with an I/O Error and does not restart. To restore the car to normal operation, release the DEL or C contactor, or place the wire back into the P terminal on the GALX-1038N or GALX-1064N board, then move the controller inspection switch to the INS position and then back to AUTO.

While the car is stopped at a landing, **CAREFULLY** jump pins 13 and 14 of chip U59 (MCC) on the GALX-1038N or GALX-1064N board. If using a GALX-1064 Rev. F board **CAREFULLY** jump pins 6 and 8 of chip U59 **OR** if using a GALX-1064 Ref G board place test jumper TST19. This simulates a shorted MCC triac. Place a call in the up direction to another landing. Observe that the car shuts down without moving to another landing. To restore the car to normal operation, CAREFULLY remove the jumper. Move the controller inspection switch to the inspection position, wait ten seconds, then place the controller inspection switch into the auto position.

While the car is stopped at a landing, **CAREFULLY** jump pins 13 and 14 of chip U58 (MCA) on the GALX-1038N or GALX-1064N board. If using a GALX-1064 Rev. F board **CAREFULLY** jump pins 6 and 8 of chip U58 **OR** if using a GALX-1064 Ref G board place test jumper TST20. This simulates a shorted MCA triac. Place a call in the up direction to another landing. Observe that the car shuts down without moving to another landing. To restore the car to normal operation, CAREFULLY remove the jumper. Move the controller inspection switch to the inspection position, wait ten seconds, then place the controller inspection switch into the auto position.

Relays:

1-Critical Components: PFC
2-Redundant Components SFC
Computer Input --- CS
3- Circuit Conforms to 2.26.9.4: Yes
4-**Test 2**
Before the car completes a run in either direction, hold in the PFC relay. Observe that the car shuts down at the landing with an I/O Error and does not restart. To restore the car to normal operation, release the PFC relay. Put the car on inspection. Put the car back on automatic.
Before the car completes a run in either direction, hold in the SFC relay. Observe that the car shuts down at the landing with an I/O Error and does not restart. To restore the car to normal operation, release the SFC relay. Put the car on inspection. Put the car back on automatic.

1.2) Solid State Devices

Up, Down, and Run Outputs:

1-Critical Components: Computer Outputs --- SU, SD, RUN, RUNA
2-Redundant Components: Computer Inputs --- SUi, SDi, RUNi, RUNAi
3-Circuit Conforms to 2.26.9.4: Yes
4-**Test 3**
While the car is stopped at a landing, **CAREFULLY** jump terminal "UN" to terminal "SU". Place a call to another landing. Observe that the car shuts down without moving to another landing. To restore the car to normal operation, remove the jumper from "UN" and "SU", move the controller inspection switch to the inspection position, wait ten seconds, then place the controller inspection switch into the auto position.

While the car is stopped at a landing, **CAREFULLY** jump terminal "UT" to terminal "SUF". Place a call above the elevator. Observe that the car shuts down without moving to another landing. To restore the car to normal operation, move the controller inspection switch to the inspection position, wait ten seconds, then place the controller inspection switch into the auto position.

While the car is stopped at a landing, **CAREFULLY** jump terminal "DN" to terminal "SD". Place a call to another landing. Observe that the car shuts down without moving to another landing. To restore the car to normal operation, remove the jumper from "UN" and "SD", move the controller inspection switch to the inspection position, wait ten seconds, then place the controller inspection switch into the auto position.

While the car is stopped at a landing, **CAREFULLY** jump terminal "DT" to terminal "SDF". Place a call below the elevator. Observe that the car shuts down without moving to another landing. To restore the car to normal operation, move the controller inspection

switch to the inspection position, wait ten seconds, then place the controller inspection switch into the auto position.

While the car is stopped at a landing, CAREFULLY jump pins 13 and 14 of chip U51 (RUN) on the GALX-1038N or GALX-1064N board. If using a GALX-1064EN Rev. F board **CAREFULLY** jump pins 6 and 8 of chip U51. **(Note: When using the GALX-1100AN CPU board you can also jump terminal RUN to GND on the GALX-1064AN rev. G board)**. This simulates a shorted RUN triac. Place a call to another landing. Observe that the car shuts down without moving to another landing. To restore the car to normal operation, CAREFULLY remove the jumper. Move the controller inspection switch to the inspection position, wait ten seconds, then place the controller inspection switch into the auto position.

While the car is stopped at a landing, CAREFULLY jump pins 13 and 14 of chip U43 (RUNA) on the GALX-1038N or GALX-1064N board. If using a GALX-1064EN Rev. F board **CAREFULLY** jump pins 6 and 8 of chip U43. **(Note: When using the GALX-1100AN CPU board you can also jump terminal SC to RUN on the GALX-1064AN rev. G board)**. This simulates a shorted RUNA triac. Place a call to another landing. Observe that the car shuts down without moving to another landing. To restore the car to normal operation, CAREFULLY remove the jumper. Move the controller inspection switch to the inspection position, wait ten seconds, then place the controller inspection switch into the auto position.

Automatic / Inspection Mode Inputs:

1-Critical Components: Computer Inputs --- AUTO, INS, ACC, MRI, ICI
2-Redundant Components: Computer Inputs --- AUTO, INS, ACC, MRI, ICI
3-Circuit Conforms to 2.26.9.4: Yes

Note: Only one of these inputs can be on at one time, and one of these inputs must be on all the time. If none of these inputs are on a fault occurs. If more than one of these inputs are on at the same time a fault occurs. Three separate means (Safety PIC Processor, Safety Pal, and Main Processor) detect the fault and shut down the car.

4-**Test 4**
While the car is stopped at a landing on Automatic service, **CAREFULLY** remove the wire from terminal “ICA” (in car automatic). Observe that the car shuts down on a inspection fault. Observe that the “PAL INHIBIT” led turns on. Observe that the “PIC INHIBIT” led turns on. To restore the car to normal operation, put the wire back into the “ICA” terminal.

While the car is stopped at a landing on Automatic service, **CAREFULLY** jump terminal “SS” to terminal “INS” (car top inspection). Observe that the car shuts down on an inspection fault. Observe that the “PAL INHIBIT” led turns on. Observe that the “PIC INHIBIT” led turns on. To restore the car to normal operation, remove the jumper.

While the car is stopped at a landing on Automatic service, **CAREFULLY** jump terminal "SS" to terminal "ACC" (Access). Observe that the car shuts down on a inspection fault. Observe that the "PAL INHIBIT" led turns on. Observe that the "PIC INHIBIT" led turns on. To restore the car to normal operation, remove the jumper.

While the car is stopped at a landing on Automatic service, **CAREFULLY** jump terminal "SS" to terminal "ICI" (in car inspection). Observe that the car shuts down on an inspection fault. Observe that the "PAL INHIBIT" led turns on. Observe that the "PIC INHIBIT" led turns on. To restore the car to normal operation, remove the jumper.

Door Lock's and Gate Inputs:

1-Critical Components:	Computer Inputs ---	DLT, DLM, DLB, RLM, GS, RGS, LBP, GBP
2-Redundant Components:	Computer Inputs ---	DLT-1, DLM-1, DLB-1, GS-1, RLM-1, RGS-1

3-Circuit Conforms to 2.26.9.4: Yes
4-**Test 5**

Before the car completes a run to the top floor, **CAREFULLY** jump Pin 12 and Pin 11 on Chip U6 on GALX-1038N board or if test points are supplied on the GALX-1038N or GALX-1064N board, jump test point TST6 (This jumps out the "DLT" door lock top Input). Observe that the car stops opens the doors then shuts down and does not restart. Three faults will occur, DLT DLT-1 Opposite Fault, Gate and Lock Fault, and I/O error Top Door Lock Fault. To restore the car to normal operation, remove the jumper, place the car on Inspection mode and return the car to automatic mode.

Before the car completes a run to the top floor, **CAREFULLY** jump Pin 12 and Pin 11 on Chip U7 On GALX-1038N board or if test points are supplied on the GALX-1038N or GALX-1064N board, jump test point TST7 (This jumps out the "DLT-1" door lock top Aux Input). Observe that the car stops opens the doors then shuts down and does not restart. Three faults will occur, DLT DLT-1 Opposite Fault, Gate and Lock Fault, and I/O error Top Door Lock Fault. To restore the car to normal operation, remove the jumper, place the car on Inspection mode and return the car to automatic mode.

Before the car completes a run to a middle floor, **CAREFULLY** jump Pin 14 and Pin 13 on Chip U6 on GALX-1038N board or if test points are supplied on the GALX-1038N or GALX-1064N board, jump test point TST8 (This jumps out the "DLM" (door lock middle Input). Observe that the car stops opens the doors then shuts down and does not restart. Three faults will occur, DLM DLM-1 Opposite Fault, Gate and Lock Fault, and I/O error Middle Door Lock Fault. To restore the car to normal operation, remove the jumper, place the car on Inspection mode and return the car to automatic mode.

Before the car completes a run to a middle floor, **CAREFULLY** jump Pin 14 and Pin 13 on Chip U7 on GALX-1038N board or if test points are supplied on the GALX-1038N or GALX-1064N board, jump test point TST9 (This jumps out the "DLM-1" (door lock

middle aux Input). Observe that the car stops opens the doors then shuts down and does not restart. Three faults will occur, DLM DLM-1 Opposite Fault, Gate and Lock Fault, and I/O error Middle Door Lock Fault. To restore the car to normal operation, remove the jumper, place the car on Inspection mode and return the car to automatic mode.

Before the car completes a run to the bottom floor, **CAREFULLY** jump Pin 16 and Pin 15 on Chip U6 on GALX-1038N board or if test points are supplied on the GALX-1038N or GALX-1064N board, jump test point TST10 (This jumps out the "DLB" (door lock bottom Input). Observe that the car stops opens the doors then shuts down and does not restart. Three faults will occur, DLB DLB-1 Opposite Fault, Gate and Lock Fault, and I/O error Bottom Door Lock Fault. To restore the car to normal operation, remove the jumper, place the car on Inspection mode and return the car to automatic mode.

Before the car completes a run to the bottom floor, **CAREFULLY** jump Pin 16 and Pin 15 on Chip U7 on GALX-1038N board or if test points are supplied on the GALX-1038N or GALX-1064N board, jump test point TST11 (This jumps out the "DLB-1" (door lock bottom aux Input). Observe that the car stops opens the doors then shuts down and does not restart. Three faults will occur, DLB DLB-1 Opposite Fault, Gate and Lock Fault, and I/O error Bottom Door Lock Fault. To restore the car to normal operation, remove the jumper, place the car on Inspection mode and return the car to automatic mode.

Before the car completes a run to any floor, **CAREFULLY** jump Pin 16 and Pin 15 on Chip U21 on GALX-1038N board or if test points are supplied on the GALX-1028N or GALX-1066N (Safety Processor) board, jump test point TST12 (This jumps out the "GS" (gate switch Input). Observe that the car stops opens the doors then shuts down and does not restart. Three faults will occur, GS GS-1 Opposite Fault, Gate and Lock Fault, and I/O error Gate Switch Fault. To restore the car to normal operation, remove the jumper, place the car on Inspection mode and return the car to automatic mode.

Before the car completes a run to any floor, **CAREFULLY** jump Pin 14 and Pin 13 on Chip U21 on GALX-1038N board or if test points are supplied on the GALX-1038N or GALX-1064N board, jump test point TST13 (This jumps out the "GS-1" (gate switch aux Input). Observe that the car stops opens the doors then shuts down and does not restart. Three faults will occur, GS GS-1 Opposite Fault, Gate and Lock Fault, and I/O error Gate Switch Fault. To restore the car to normal operation, remove the jumper, place the car on Inspection mode and return the car to automatic mode.

While the car is stopped at a landing on Automatic service, move the door lock bypass switch to the bypass position. Observe that the car shuts down on a door lock bypass fault. Observe that the "PAL INHIBIT" led turns on. Observe that the "PIC INHIBIT" led turns on. To restore the car to normal operation, move the door lock bypass switch to the open position.

While the car is stopped at a landing on Automatic service, move the car gate bypass switch to the bypass position. Observe that the car shuts down on a car gate by pass fault. Observe that the "PAL INHIBIT" led turns on. Observe that the "PIC INHIBIT" led

turns on. To restore the car to normal operation, move the car gate bypass switch to the open position.

For Rear Floors if Applicable:
Before the car completes a run to a middle floor, **CAREFULLY** jump Pin 10 and Pin 9 on Chip U6 on GALX-1038N board or if test points are supplied on the GALX-1038N or GALX-1064N board, jump test point TST14 (This jumps out the "RLM" (rear door lock middle Input). Observe that the car stops opens the doors then shuts down and does not restart. Three faults will occur, RLM RLM-1 Opposite Fault, Gate and Lock Fault, and I/O error Rear Door Lock Fault. To restore the car to normal operation, remove the jumper, place the car on Inspection mode and return the car to automatic mode.

Before the car completes a run to a middle floor, **CAREFULLY** jump Pin 10 and Pin 9 on Chip U7 on GALX-1038N board or if test points are supplied on the GALX-1038N or GALX-1064N board, jump test point TST15 (This jumps out the "RLM-1" (rear door lock middle aux Input). Observe that the car stops opens the doors then shuts down and does not restart. Three faults will occur, RLM RLM-1 Opposite Fault, Gate and Lock Fault, and I/O error Rear Door Lock Fault. To restore the car to normal operation, remove the jumper, place the car on Inspection mode and return the car to automatic mode.

Before the car completes a run to any floor, **CAREFULLY** jump Pin 16 and Pin 15 on Chip U33 on GALX-1038N board or if test points are supplied on the GALX-1028N or GALX-1066N (Safety Processor) board, jump test point TST16 (This jumps out the "RGS" (rear gate switch Input). Observe that the car stops opens the doors then shuts down and does not restart. Three faults will occur, RGS RGS-1 Opposite Fault, Gate and Lock Fault, and I/O error Rear Gate Switch Fault. To restore the car to normal operation, remove the jumper, place the car on Inspection mode and return the car to automatic mode.

Before the car completes a run to any floor, **CAREFULLY** jump Pin 14 and Pin 13 on Chip U33 on GALX-1038N board or if test points are supplied on the GALX-1038N or GALX-1064N board, jump test point TST17 (This jumps out the "RGS-1" (rear gate switch aux Input). Observe that the car stops opens the doors then shuts down and does not restart. Three faults will occur, RGS RGS-1 Opposite Fault, Gate and Lock Fault, and I/O error Rear Gate Switch Fault. To restore the car to normal operation, remove the jumper, place the car on Inspection mode and return the car to automatic mode.

On the GALX-1066AN safety processor board verify under adjust variables, rear door is enabled to a 1. Change rear door parameter to 0. Place the car on inspection. Remove the wire from the RLM terminal on the GALX-1064N board. Verify that the PAL LED on the safety processor turns on. Verify that the car is unable to run on inspection. Place the wire back into the RLM terminal. Repeat the process with the RGS terminal. Afterwards change rear door parameter back to 1 on the GALX-1066AN safety processor board.

In Car Stop Switch Bypass:

1-Critical Components: FST
2- Redundant Components: FSTi, FST1
3-Circuit Conforms to 2.26.9.4: Yes
4-**Test 6**
While the car is stopped at a landing on Automatic service **CAREFULLY** jump terminal "SFC" to pin 11 on the FST output chip U63 or if test points are supplied on the GALX-1038N or GALX-1064N board, jump test point TST18. Observe that the car shuts down and will not leave a landing. To restore the car to normal operation, remove the jumper, place the car on Inspection mode and return the car to automatic mode.

Computer Hardware:

1-Critical Components: Safety PAL on GALX-1028N or GALX-1066N Board
PIC Processor on GALX-1028N or GALX-1066N Board
GALX-0028N Main Processor
2-Redundant Components: Safety PAL on GALX-1028N or GALX-1066N Board
PIC Processor on GALX-1028N or GALX-1066N Board,
GALX- 0028N Main Processor
3-Circuit Conforms to 2.26.9.4: Yes
4-**Test 7**
While the car is stopped at a landing on Automatic service, move the door lock bypass switch to the bypass position. Observe that the car shuts down on a door lock bypass fault. Observe that the "PAL INHIBIT" led turns on. Observe that the "PIC INHIBIT" led turns on. To restore the car to normal operation, move the door lock bypass switch to the open position.

1-Critical Components: Watchdog Timer
2-Redundant Components: Galaxy Elevator Software
3-Circuit Conforms to 2.26.9.4: Yes
4-**Test 8**
Put the car on inspection. Push the Up button on the GALX-1021 board to scroll through the menu until "Software Version" is on the screen. Press the enter button. Press the Up button until "Test Watchdog Reset" is on the screen. Press the enter button twice. Observe the LED on the Microprocessor board will stop blinking. After a few seconds the Galaxy power up message should appear on the LCD screen. This test stops petting the watchdog timer, which causes the timer to reset the microprocessor and turn off all outputs. This simulates what would happen if the software system stopped functioning.

Verify that the version number and the checksum number on the PAL device on the GALX-1066AN board, safety processor board matches the version number and checksum number on the job's attestation sheet.

1.3) Software System:

1-Critical Components: Galaxy Elevator Software
2-Redundant Components: Watchdog Timer
3-Circuit Conforms to 2.26.9.4: Yes
4-**Test 9**
Test 8 also checks the Watchdog output.

1.4) Leveling Limits:

1-Critical Components: Selector DZ output
2-Redundant Components: Selector DZA output
Computer Input --- DZ, DZA
3-Circuit Conforms to 2.26.9.4: Yes
4-**Test 10**
While the car is stopped at a landing, **CAREFULLY** jump terminal "S10" to terminal "DZ" (door zone). Place a call to another landing. Observe that the when the car stops at the next landing and opens the doors, that it shuts down on a door zone fault. To restore the car to normal operation, remove the jumper. Place the car on inspection for 10 seconds, and then put the car back onto Automatic operation.

While the car is stopped at a landing, **CAREFULLY** jump terminal "S10" to terminal "DZA" (door zone aux). This jumper needs to be placed on the GALX-1040AN or GALX-1037AN car top board. Check job specific prints for which board is applicable. Place a call to another landing. Observe that the when the car stops at the next landing and opens the doors, that it shuts down on a door zone fault. To restore the car to normal operation, remove the jumper. Place the car on inspection for 10 seconds, and then put the car back onto Automatic operation.

1.5) Single Ground:

1-Redundant Components: Fuse L1 & Fuse S10
2-Circuit Conforms to 2.26.9.4: Yes
3-**Test 11**
With the "safety string" closed, short terminal "SS" to terminal "GND" or inside the fire fighters panel CAREFULLY jump "SS" (on the fire fighters switch stop switch) to the metal of the COP. Observe that the S10 (and/or L1) fuse clears, and the car will not move. Replace cleared fuse.

With the doors closed and locked, short terminal "DLM" to terminal "GND" or at a floor, short "GS1" (inside the gate switch) to the case of the gate switch. Observe that the S10 (and/or L1) fuse clears, and the car will not move. Replace cleared fuse.

2. Contactors/Relays are used to meet 2.26.8.2 or 2.26.9.3 to 2.26.9.7 & if used for MONITORING Purposes [see2.26.3]- Identify below

2.1) Critical Circuits (2.26.9.3)

No relays used for monitoring purposes.

2.2) Redundancy Checking (2.26.9.4)

No relays used for monitoring purposes.

3. Conformance / Test Procedures required for Electrical Equipment – Indicate / Demonstrate:

3.1) The car will not revert to normal operation[2.26.9.3(d) When on:

1- Bypass
2- Access
3- Inspection
Note: Three separate means (Safety Pal (discrete logic), Safety PIC Processor (software means), and Main Processor (software means)) detect the fault and shut down the car. Test 4 demonstrates how to test.

3.2) The door interlocks & contacts will return to effectiveness [2.26.9.3(e)] when these switches are turned off:

1- Bypass
2- Access
Note: Three separate means (Safety Pal (discrete logic), Safety PIC Processor (software means), and Main Processor (software means)) detect the fault and shut down the car. Test 5 demonstrates how to test.

3.3) Bypass circuits (if any) meet 2.26.9.3 & .4 (redundancy checking) per 2.26.1.5.3:

1- Bypass
Note: Three separate means (Safety Pal (discrete logic), Safety PIC Processor (software means), and Main Processor (software means)) detect the fault and shut down the car. Test 5 demonstrates how to test.

3.4) Normal Terminal Stopping Device

That the NTSD [3.25.1] functions independently of operation of normal stopping means.

1) Put the car on inspection, which will render the normal elevator stopping means inoperative.
2) Remove wire from the UN terminal.
3) Verify that the car will move down and not up.
4) Replace the wire in the UN terminal.
5) Remove wire from the DN terminal.
6) Verify that the car will move up and not down.
7) Replace the wire in the DN terminal.
8) Place the car back onto Automatic operation.

3.5) Terminal Speed Reducing Device

Terminal speed reducing devices shall be installed for the up direction where the car speed exceeds 0.25 m/s (50ft/min) to ensure that the plunger does not strike its solid limit of travel at a speed in excess of 0.25 m/s (50 ft/min).

1) Put the car on inspection, which will render the normal elevator stopping means inoperative.
2) Adjust the inspection speed under Adjustable Variables, Car Motion to contract speed of elevator. This will allow the car to run at high speed on inspection.
3) Run the car in the up direction and monitor the speed of the elevator on the safety processor board (GALX-1066AN board).
4) Once the elevator hits the UT slowdown switch the up high speed solenoid will deenergize and the car will run at leveling speed.
5) Restore the inspection speed parameter under Adjustable Variables, Car Motion to its original value.

3.6) Phase I & II 153.20 Load-Weighing Device

With (100 or 125%) full load in car verify that the load weighing device does not interfere with Phase 1 [2.27.3.1.6] or Phase II [2.27.3.31(i)].

Where applicable, with the car on normal, automatic operation away from the designated level, simulate a full load (method varies according to device used); then activate Phase I and make sure that the car responds in accordance with Phase I requirements.

Where applicable with the car on Phase II operation, simulate a full load (method varies according to device used), and make sure that the car responds in accordance with Phase II requirements.

3.7) Phase II & Ground

That a ground or short circuit in electrical parts located at landing side of H/W enclosure and associated wiring will not disable Phase II operation after it is activated [2.27.3.4]

1) Determine if controller is supplying high voltage (120vac) or low voltage (24vac) to the smoke detector contacts and Phase 1 switches. If the controller is supplying

high voltage, while the car is on Phase II, short to ground the HC terminal in the landing fixture. The HC fuse will clear. Verify that Phase II operation remains unaffected. If the controller is supplying low voltage, while the car is on Phase II, short to ground the FSP24 terminal in the landing fixture. The FSP24 fuse will clear. Verify that Phase II operation remains unaffected.

2) Replace HC fuse, if controller is supplying high voltage. Replace the FSP24 if controller is supplying low voltage.

3.8) Phase I & II 153.20 Power Off

That the elevator will find its position after power interruption and restoration, as to not be removed from Phase I or II [2.27.3.4]

1) Power off the controller while the car is on Phase I at any floor away from the designated landing. Restore power to the controller. The car will remain on Phase I and proceed to the designated level.
2) Power off the controller while the car is on Phase I at the designated landing. Restore power to the controller. The car will remain on Phase I at the designated landing.
3) Power off the controller at any landing while the car is on Phase II. Restore power to the controller. The car will remain on Phase II at that landing until the firefighter enters a call.
4) Power off the controller while the car is moving between floors and on Phase II. Restore power to the controller. The car will move to an available floor and stop. It will remain on Phase II at that landing until the firefighter enters a call.

3.9) Recycling Operation

By simulating the recycling operation [3.26.7]

With the car at the bottom floor, with the doors closed and no calls registered, from the GALX-1021 board change the time to 2:01 AM. The car should move down at leveling speed. While the car is leveling down register a hall call above the bottom floor. The car will continue to level down until the car rests on the springs. The car will level up to the bottom floor.

3.10) Plunger Gripper

The gripper will remain operational during a power failure. While the elevator is running down, remove power from the controller and verify the gripper sets.

3.11) Phase I under Special Conditions

That if Phase I is activated while elevator is responding to any "SD", the car will return to recall level or as specified in 3.27.1

Always reference the job specific prints to verify the location of the terminal for any special devices (e.g. low oil switch, plunger-follower guide protection, etc.) on the controller

While the car is at the top floor initiate the special device. This will initiate a recall. While the car is returning, turn the fire service Phase I hall switch to the ON position. If

the elevator is above the recall floor the elevator will stop at the recall floor and open its doors. If the elevator is below the recall floor the elevator will stop at the bottom floor and open its doors. The doors will close after the door time. Press the door open button and verify that the doors will open. To restore the car to normal operation, remove the jumper or replace the wire back, move the controller inspection switch to the inspection position, on the LCD Board GALX-1021N push the up button to go to "Elevator Setup", push the enter button, push the up button to go to the "Reset Special Device" push the enter button, then place the controller inspection switch into the auto position. Turn the fire service Phase I switch to the RESET position then back to the OFF position.

Determine if controller is supplying high voltage (120vac) or low voltage (24vac) to the emergency power circuit. If the controller is supplying high voltage while the car is at the top floor, **CAREFULLY** jump LC terminal to EMP terminal on the GALX-1064AN board. If the controller is supplying low voltage while the car is at the top floor, **CAREFULLY** jump FSP24 terminal to EMP terminal on the GALX-1023DVN board. This will initiate an auxiliary power lowering return. While the car is returning, turn the fire service Phase I hall switch to the on position. If the elevator is above the recall floor the elevator will stop at the recall floor and open its doors. If the elevator is below the recall floor the elevator will stop at the bottom floor and open its doors. The doors will close after the door time. Press the door open button and verify that the doors will open. To restore the car to normal operation, remove the jumper. Turn the fire service Phase I switch to the RESET position then back to the OFF position.

3.12) Phase I under Special Conditions

That if any "SD" is activated while Phase I is in effect, but before car reaches recall level, the car will complete Phase I or descend to a level per 3.27.2

Always reference the job specific prints to verify the location of the terminal for any special devices (e.g. low oil switch, plunger-follower guide protection, etc.) on the controller.

While the car is at the top floor, turn the fire service Phase I hall switch to the ON position. While the car is returning initiate the special device. If the elevator is above the recall floor the elevator will stop at the recall floor and open its doors. If the elevator is below the recall floor the elevator will stop at the bottom floor and open its doors. The doors will close after the door time. Press the door open button and verify that the doors will open. To restore the car to normal operation, remove the jumper or replace the wire back, move the controller inspection switch to the inspection position, on the LCD Board GALX-1021N push the up button to go to "Elevator Setup", push the enter button, push the up button to go to the "Reset Special Device" push the enter button, then place the controller inspection switch into the auto position. Turn the fire service Phase I switch to the RESET position then back to the OFF position.

While the car is at the top floor, turn the fire service Phase I hall switch to the ON position. Determine if controller is supplying high voltage (120vac) or low voltage (24vac) to the emergency power circuit. If the controller is supplying high voltage while

the car is returning, **CAREFULLY** jump LC terminal to EMP terminal on the GALX-1064AN board. If the controller is supplying low voltage while the car is returning, **CAREFULLY** jump FSP24 terminal to EMP terminal on the GALX-1023DVN board. If the elevator is above the recall floor the elevator will stop at the recall floor and open its doors. If the elevator is below the recall floor the elevator will stop at the bottom floor and open its doors. The doors will close after the door time. Press the door open button and verify that the doors will open. To restore the car to normal operation, remove the jumper. Turn the fire service Phase I switch to the RESET position then back to the OFF position.

3.13) Phase I under Special Conditions

That, if a "SD"(a) or (c) is activated while Phase I is in effect with the car at the recall level, the door will close per 3.27.3

Always reference the job specific prints to verify the location of the terminal for any special devices (e.g. low oil switch, plunger-follower guide protection, etc.) on the controller.

Turn the fire service Phase I hall switch to the ON position. After the elevator has returned to the recall floor and opened the doors initiate the special device. Verify that the doors close and the fire light flashes on and off. To restore the car to normal operation, remove the jumper or replace the wire back, move the controller inspection switch to the inspection position, on the LCD Board GALX-1021N push the up button to go to "Elevator Setup", push the enter button, push the up button to go to the "Reset Special Device" push the enter button, then place the controller inspection switch into the auto position. Turn the fire service Phase I switch to the RESET position then back to the OFF position.

Turn the fire service Phase I hall switch to the ON position. After the elevator has returned to the recall floor and opened the doors determine if controller is supplying high voltage (120vac) or low voltage (24vac) to the emergency power circuit. If the controller is supplying high voltage, **CAREFULLY** jump LC terminal to EMP terminal on the GALX-1064AN board. If the controller is supplying low voltage, **CAREFULLY** jump FSP24 terminal to EMP terminal on the GALX-1023DVN board. Verify that the doors close and the fire light flashes on and off. To restore the car to normal operation, remove the jumper, turn the fire service Phase I switch to the RESET position then back to the OFF position.

3.14) Phase II under Special Conditions

That, if any "SD" is activated while the car is on Phase II, the elevator will function as specified in 3.27.4

Always reference the job specific prints to verify the location of the terminal for any special devices (e.g. low oil switch, plunger-follower guide protection, etc.) on the controller.

Turn the fire service Phase I hall switch to the ON position. After the elevator has returned to the recall floor and opened the doors turn the In Car Fire Service Phase II switch to the ON position. Initiate the special device. Verify the fire light flashes on and off. Verify that only calls below the elevator will register. To restore the car to normal operation, remove the jumper or replace the wire back, move the controller inspection switch to the inspection position, on the LCD Board GALX-1021N push the up button to go to "Elevator Setup", push the enter button, push the up button to go to the "Reset Special Device" push the enter button, then place the controller inspection switch into the auto position. Turn the fire service Phase II switch to the OFF position. Turn the fire service Phase I switch to the RESET position then back to the OFF position.

Turn the fire service Phase I hall switch to the ON position. After the elevator has returned to the recall floor and opened the doors turn the in car fire service phase II switch to the ON position. Determine if controller is supplying high voltage (120vac) or low voltage (24vac) to the emergency power circuit. If the controller is supplying high voltage, **CAREFULLY** jump LC terminal to EMP terminal on the GALX-1064AN board. If the controller is supplying low voltage, **CAREFULLY** jump FSP24 terminal to EMP terminal on the GALX-1023DVN board. Verify the fire light flashes on and off. Verify that only calls below the elevator will register. To restore the car to normal operation, remove the jumper. Turn the fire service Phase II switch to the OFF position. Turn the fire service Phase I switch to the RESET position then back to the OFF position.

3.15) Plunger Follower Guide (if applicable)

That the car will stop or lower should plunger length exceed maximum free length. [3.18.2.7.1]

Always reference the job specific prints to verify the location of the terminal for any special devices (e.g. low oil switch, plunger-follower guide protection, etc.) on the controller.

While the car is at the top floor initiate the special device. The elevator will return to the bottom floor and open its doors. The doors will close after the door time. Press the door open button and verify that the doors will open. To restore the car to normal operation, remove the jumper or replace the wire back, move the controller inspection switch to the inspection position, on the LCD Board GALX-1021N push the up button to go to "Elevator Setup", push the enter button, push the up button to go to the "Reset Special Device" push the enter button, then place the controller inspection switch into the auto position.

3.16) Auxiliary Power Lowering

That the auxiliary power supply will be interrupted when the main power supply disconnect switch is open [3.26.10]

Pull the disconnect switch verify that the LCD display on the GALX-1021 board is off. With a voltage meter verify that there is no voltage between the LIN terminal and the GND terminal. To restore the car to normal operation put the disconnect switch back in.

3.17) Pressure Switch

That when activated the switch will prevent operation of lowering valve(s) and automatic door opening [3.26.8]

Always reference the job specific prints to verify the location of the terminal for low pressure switch on the controller.

If the pressure switch is normally open:

While the car is at the top floor, **CAREFULLY** jump LC terminal to EMH terminal. This will simulate a low pressure condition. Try to register a down call, the elevator should not move down. Press a hall call at the top floor the doors should not open. To restore the car to normal operation, remove the jumper.

If the pressure switch is normally closed:

While the car is at the top floor, **CAREFULLY** remove the wire from terminal EMH. This will simulate a low pressure condition. Try to register a down call, the elevator should not move down. Press a hall call at the top floor the doors should not open. To restore the car to normal operation, replace the wire in the EMH terminal.

3.18) Motor Phase Protection

That pump-motor will not over-heat due to (a) a phase failure (b) phase reversal / rotation per [3.26.5]

(a) With elevator stopped, open one feed line and verify elevator will not run

(b) With elevator stopped, reverse two feed lines and verify elevator will not start

3.19) Emergency Power

Were an emergency or standby power system is provided, demonstrate conformance to 2.27.2 by simulation.

Were Applicable, simulate emergency power. Determine if controller is supplying high voltage (120vac) or low voltage (24vac) to the emergency power circuit. If the controller is supplying high voltage, **CAREFULLY** jump LC terminal to EMP terminal on the GALX-1064AN board. If the controller is supplying low voltage, **CAREFULLY** jump FSP24 terminal to EMP terminal on the GALX-1023DVN board. Make sure that the elevators comply with 2.27.2. To restore to normal operation remove jumper from EMP terminal.

3.20) Control and Operating Circuits

Upon activation of the contact will remove power from the hydraulic driving-machine motor (in reference to **3.26.6.5**).

Always reference the job specific prints to verify the location of the terminal for hot oil input on the controller.

While the car is moving up, remove the **field** wire from terminal TPH to simulate a rise in temperature above the liquid maximum operating temperature in the hydraulic driving machine. Verify that the elevator will stop and remove power from the hydraulic driving-machine motor. The hydraulic driving machine motor shall not restart and if the

doors are closed, the car shall automatically be brought to the lowest landing and then operate in conformance to 3.26.9.2 and 3.26.9.3.

To restore the car to normal operation, place the **field** wire back on terminal TPH, move the controller inspection switch to the inspection position, on the LCD Board GALX-1021N push the up button to go to “Elevator Setup”, push the enter button, push the up button to go to the “Reset Hot Oil” push the enter button, then place the controller inspection switch into the auto position.

End of Document.

revision history: version 1.06a

Revised language in test procedure number 3.6, code requirement 2.27.3.4 on page 11.

Reason: Provide language to test for low voltage option.

revision history: version 1.06b

Revised test procedure number 3.19.

revision history: version 1.06c

Revised test procedure to test for shorted MCC and MCA output triacs in the up direction of travel only (paragraphs 2 and 3 on page 2).

revision history: version 1.06d

Revised test #10 to specify location of DZA on either the GALX-1040 or GALX-1037 board.

Revised test #3.10, 3.11, and 3.12 to provide language to test for low voltage option for EMP.

Included verification of version number and checksum on PAL device on the GALX-1066AN Safety Processor Board on page 8.

revision history: version 1.06e

Revised test procedure to test for shorted MCC and MCA output triacs to include jumping terminal S10 to MC and MCA.

revision history version 1.06f

Added verbiage on page 4 to include testing of RUN and RUNA traic outputs shorted when utilizing the GALX-1100AN CPU board. Purpose of this change is when utilizing the GALX-110AN CPU board, access to the RUN and RUNA triac IC's are obstructed and inaccessible.

Revised test #3.13 to provide language to test for low voltage option for EMP.

revision history version 1.06g

Included verbiage on page 4 to include board GALX-1064EN and include the option to perform RUN and RUNA test when using a GALX-1100AN board.

revision history version 1.06h

Included verbiage on page 7 to check GALX-1066AN (safety processor board) board for rear door application.

revision history version 1.06i

Included verbiage on page 16, 3.18) Emergency Power, when using 24VAC fire service and emergency power I/O board.

Revision history version 1.06j

Revised verbiage for test 3.10 through test 3.14 regarding terminal location of special devices.

Revision history version 1.06k

Corrected test procedure on page 7 to check GALX-1066AN (safety processor board) for rear door application.

Revision history version 1.06L

Included verbiage to test shorted MC and MCA output individually using new test jumpers TST19 and TST 20 respectively using the new GALX-1064AN revision G board.

Added test procedure for terminal speed reducing devices on page 11.