



# **GALaxy eHydro Controller Conformance Document and Compliance Test Procedure**

GALaxy eHydro Elevator Controller

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The following procedure describes the methods used to test the controller for compliance with ASME A17.1-2010/CSA B44-10, ASME A17.1-2013/CSA B44-13, ASME A17.1-2016/CSA B44-16, and ASME A17.1-2019/CSA B44-19.

**Note:** All test jumpers referenced in this document are located on the main I/O board.

## **Redundancy & Monitoring in critical Circuits 2.26.9.3 & 2.26.9.4**

### **Magnetically Operated Devices**

#### **Relays:**

Critical Components: Relay RUN  
Redundant Components Computer Input RUNi,  
Computer Outputs RUN, SU, SD  
Circuit Conforms to 2.26.9.4: Yes

#### **Test 2**

Place a test jumper on the run output, then register a call. Observe that the car shuts down at the landing and does not restart. To restore the car to normal operation, remove the test jumper. Put the car on inspection. Put the car back on automatic.

### **Solid State Devices**

#### **Up, Down, and Run Outputs:**

Critical Components: Computer Outputs --- SU, SD, SDF, SUF, DN, DT, UN, UT  
Redundant Components: Computer Inputs --- SUI, SDI, SDFi, SUFi, DNi, DTi, UNi, UTi  
Circuit Conforms to 2.26.9.4: Yes

#### **Test 3**

While the car is stopped at the bottom landing, **CAREFULLY** place a test jumper on the “SU” output. Place a call above the elevator. Observe that the car shuts down without moving to another landing. To restore the car to normal operation, remove the test jumper, move the controller inspection switch to the inspection position, then place the controller inspection switch into the auto position.

While the car is stopped at the bottom landing, **CAREFULLY** place a test jumper on the “SUF” output. Place a call above the elevator. Observe that the car shuts down without moving to another landing. To restore the car to normal operation, remove the test jumper, move the controller inspection switch to the inspection position, then place the controller inspection switch into the auto position.

While the car is stopped at the bottom landing, **CAREFULLY** place a test jumper on the “UN” output. Place a call above the elevator. Observe that the car shuts down without moving to another landing. To restore the car to normal operation, remove the test jumper, move the controller inspection switch to the inspection position, then place the controller inspection switch into the auto position.

While the car is stopped at the bottom landing, **CAREFULLY** place a test jumper on the “UT” output. Place a call above the elevator. Observe that the car shuts down without moving to another landing. To restore the car to normal operation, remove the test jumper, move the controller inspection switch to the inspection position, then place the controller inspection switch into the auto position.

While the car is stopped at the top landing, **CAREFULLY** place a test jumper on the “SD” output. Place a call below the elevator. Observe that the car shuts down without moving to another landing. To restore the car to normal operation, remove the test jumper, move the controller inspection switch to the inspection position, then place the controller inspection switch into the auto position.

While the car is stopped at the top landing, **CAREFULLY** place a test jumper on the “SDF” output. Place a call below the elevator. Observe that the car shuts down. To restore the car to normal operation, remove the test jumper, move the controller inspection switch to the inspection position, then place the controller inspection switch into the auto position.

While the car is stopped at the top landing, **CAREFULLY** place a test jumper on the “DN” output. Place a call below the elevator. Observe that the car shuts down without moving to another landing. To restore the car to normal operation, remove the test jumper, move the controller inspection switch to the inspection position, then place the controller inspection switch into the auto position.

While the car is stopped at the top landing, **CAREFULLY** place a test jumper on the “DT” output. Place a call below the elevator. Observe that the car shuts down without moving to another landing. To restore the car to normal operation, remove the test jumper, move the controller inspection switch to the inspection position, then place the controller inspection switch into the auto position.

#### Automatic / Inspection Mode Inputs:

Critical Components: Computer Inputs --- AUTO, INS, ACC, MRI, ICI

Redundant Components: Computer Inputs --- AUTO, INS, ACC, MRI, ICI

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. Two separate means (Safety Pal, and Main Processor) detect the fault and shut down the car.

#### **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. Observe that the “PAL FAULT” 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 “HSS” to terminal “INS” (car top inspection). Observe that the car shuts down. Observe that the “PAL FAULT” 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 “HSS” to terminal “ACC” (Access). Observe that the car shuts down. Observe that the “PAL FAULT” 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 “HSS” to terminal “ICI” (in car inspection). Observe that the car shuts down. Observe that the “PAL FAULT” led turns on. To restore the car to normal operation, remove the jumper.

#### Door Lock’s and Gate Inputs:

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

Redundant Components: Computer Inputs --- DLT-1, DLM-1, DLB-1, GS-1,  
RLM-1, RGS-1

Circuit Conforms to 2.26.9.4: Yes

#### **Test 5**

With the car at the top floor, **CAREFULLY** place a test jumper on J13 (This jumps out the “DLT” door lock top Input). Place a call to the top floor to open the doors. Observe that the car shuts down and does not restart. To restore the car to normal operation, remove the jumper, place the car on Inspection mode and return the car to automatic mode.

With the car at the top floor, **CAREFULLY** place a test jumper on J14 (This jumps out the “DLT1” door lock top 1 Input). Place a call to the top floor to open the doors. Observe that the car shuts down and does not restart. To restore the car to normal operation, remove the jumper, place the car on Inspection mode and return the car to automatic mode.

#### ***Perform the following test only if more than 2 stops.***

With the car at a middle floor, **CAREFULLY** place a test jumper on J11 (This jumps out

the “DLM” door lock middle Input). Place a call to the current floor to open the doors. Observe that the car shuts down and does not restart. To restore the car to normal operation, remove the jumper, place the car on Inspection mode and return the car to automatic mode.

***Perform the following test only if more than 2 stops.***

With the car at a middle floor, **CAREFULLY** place a test jumper on J12 (This jumps out the “DLM1” door lock middle 1 Input). Place a call to the current floor to open the doors. Observe that the car shuts down and does not restart. To restore the car to normal operation, remove the jumper, place the car on Inspection mode and return the car to automatic mode

With the car at the bottom floor, **CAREFULLY** place a test jumper on J9 (This jumps out the “DLB” door lock bottom Input). Place a call to the bottom floor to open the doors. Observe that the car shuts down and does not restart. To restore the car to normal operation, remove the jumper, place the car on Inspection mode and return the car to automatic mode.

With the car at the bottom floor, **CAREFULLY** place a test jumper on J10 (This jumps out the “DLB1” door lock bottom 1 Input). Place a call to the bottom floor to open the doors. Observe that the car shuts down and does not restart. To restore the car to normal operation, remove the jumper, place the car on Inspection mode and return the car to automatic mode.

With the car at the bottom floor, **CAREFULLY** place a test jumper on J8 (This jumps out the “GS” gate switch Input). Place a call to the bottom floor to open the doors. Observe that the car shuts down and does not restart. To restore the car to normal operation, remove the jumper, place the car on Inspection mode and return the car to automatic mode.

With the car at the bottom floor, **CAREFULLY** place a test jumper on J7 (This jumps out the “GS1” gate switch 1 Input). Place a call to the bottom floor to open the doors. Observe that the car shuts down and does not restart. 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. Observe that the “PAL FAULT” 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. Observe that the “PAL FAULT” 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:**

***Perform the following test if more than 2 stops, or 2 stops with a front and a rear door at the same floor.***

With the car at a middle floor, **CAREFULLY** place a test jumper on J15 (This jumps out the “RLM” rear door lock middle Input). Place a call to the current floor to open the doors. Observe that the car shuts down and does not restart. To restore the car to normal operation, remove the jumper, place the car on Inspection mode and return the car to automatic mode.

***Perform the following test if more than 2 stops, or 2 stops with a front and a rear door at the same floor.***

With the car at a middle floor, **CAREFULLY** place a test jumper on J16 (This jumps out the “RLM1” rear door lock middle 1 Input). Place a call to the current floor to open the doors. Observe that the car shuts down and does not restart. To restore the car to normal operation, remove the jumper, place the car on Inspection mode and return the car to automatic mode

With the car at the bottom floor, **CAREFULLY** place a test jumper on J6 (This jumps out the “RGS” rear gate switch Input). Place a call to the bottom floor to open the doors. Observe that the car shuts down and does not restart. To restore the car to normal operation, remove the jumper, place the car on Inspection mode and return the car to automatic mode.

With the car at the bottom floor, **CAREFULLY** place a test jumper on J5 (This jumps out the “RGS1” rear gate switch 1 Input). Place a call to the bottom floor to open the doors. Observe that the car shuts down and does not restart. 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:**

Critical Components: Main Processor

Redundant Components: Safety Pal

Circuit Conforms to 2.26.9.4: Yes

**Test 7**

While the car is stopped at a landing on Automatic service, move the “hoistway door locks” bypass switch to the bypass position. Observe that the “PAL FAULT” led turns on. To restore the car to normal operation, move the “hoistway door locks” bypass switch to the open position.

While the car is stopped at a landing on Automatic service, move the “car door locks” bypass switch to the bypass position. Observe that the “PAL FAULT” led turns on. To restore the car to normal operation, move the “car door locks” bypass switch to the open position.

Critical Components: Watchdog Timer  
Redundant Components: Galaxy Elevator Software  
Circuit Conforms to 2.26.9.4: Yes

#### **Test 8**

Put the car on inspection. Push the Up button on the LCD user interface to scroll through the menu until “Software Utilities” 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. After a few seconds the Galaxy power up message should appear on the LCD user interface.

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.

#### **Software System:**

Critical Components: Galaxy Elevator Software  
Redundant Components: Watchdog Timer  
Circuit Conforms to 2.26.9.4: Yes

#### **Test 9**

Test 8 also checks the Watchdog output.

#### **Leveling Limits:**

Critical Components: Selector output to main processor  
Redundant Components: Selector output to NTS processor  
Circuit Conforms to 2.26.9.4: Yes

#### **Test 10**

Remove the Selector Can 1 plug. This stops communication from the main CPU to the Selector. Observe that the car shuts down and does not restart. To restore the car to normal operation, replace the Selector CAN 1 plug.

Remove the NTS Can plug. This stops communication from the main NTS processor to the Selector. Observe that the car shuts down and does not restart. To restore the car to normal operation, replace the NTS CAN 1 plug.

#### **Inner Landing Zone Test.**

Take the elevator to the bottom floor. Put the car on inspection and run the car up until the DZ light goes off, but DL light is still on. Remove the DLB wire. Put the car back on automatic. Notice that the “PAL FAULT” light is on. Observe that the car shuts down and does not restart. Momentary touch the DLB wire back to the DLB terminal and notice that the car starts to move. To restore the car to normal operation, replace the DLB wire.

## **Single Ground:**

Redundant Components: Fuse L1 & Fuse S10

Circuit Conforms to 2.26.9.4: Yes

### **Test 11**

With the “safety string” closed, short terminal “HSS” to terminal “GND” or inside the fire fighters’ panel CAREFULLY jump “HSS” (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.

**If 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 [see 2.26.3]- Identify below**

### **Critical Circuits (2.26.9.3)**

No relays used for monitoring purposes.

### **Redundency Checking (2.26.9.4)**

No relays used for monitoring purposes.

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

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

- Bypass
- Access
- Inspection

Note: Two separate means (Safety Pal (discrete logic), and Main Processor (software means)) detect the fault and shut down the car.

Test 4 demonstrates how to test.



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

- Bypass
- Access

Note: Two separate means (Safety Pal (discrete logic), and Main Processor (software means)) detect the fault and shut down the car.

Test 5 demonstrates how to test.

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

- Bypass

Note: Two separate means (Safety Pal (discrete logic), and Main Processor (software means)) detect the fault and shut down the car.

Test 5 demonstrates how to test.

**NTSD**

**That the NTSD [3.25.1] function independently of operation of normal stopping means and ETSD per 2.25.2.1.2**

The NTS processor has a separate CAN channel to the SIL 3 APS selector head. The NTS processor controls “UN”, “UT”, “DT”, “DN”.

In “HOISTWAY TABLES”, “SET SLOWDOWN COUNTS”, “SET SLOWDOWN COUNTS FOR ALL”, set “UP” to a count of 102 or 2 inches. This distance is closer than the UT distance. With the car at the bottom floor set a call to the top floor. Notice the car slowdown normally but a “UT Limit Fault” is logged. Reset the “UP” count back to its prior value. Place the car on Inspection mode this will render the normal elevator stopping means inoperative. Run the car up on inspection verify the car stops 2 inches above the top floor.

In “HOISTWAY TABLES”, “SET SLOWDOWN COUNTS”, “SET SLOWDOWN COUNTS FOR ALL”, set “DOWN” to a count of 102 or 2 inches. This distance is closer than the DT distance. With the car at the top floor set a call to the bottom floor. Notice the car slowdown normally but a “DT Limit Fault” is logged. Reset the “DOWN” count back to its prior value. Place the car on Inspection mode this will render the normal elevator stopping means inoperative. Run the car down on inspection verify the car initiates a stop 2 inches below the bottom floor. Place the controller inspection switch into the auto position.

**Terminal Speed Reducing Device**

**Terminal speed reducing devices shall be installed for the up direction where the car speed exceeds 0.25m/s (50ft/min) to ensure the plunger does not strike its solid limit of travel at a speed in excess of .25m/s (50 ft/min).**

With the car at the bottom floor, place a call one floor above. While the car is running CAREFULLY remove the wire from the TSD terminal. The TSD switch is directly in series with the UP Fast Solenoid. Verify the car immediately starts to slow down. The

switch is independent of the normal stopping means, and normal terminal stopping device. Replace the wire back in the TSD. To restore the car to normal operation if the low oil timer expired, move the controller inspection switch to the inspection position, on the LCD user interface, push the up button to go to “RESET FAULTS”, push the enter button, push the up button to go to the “Reset Low Oil” push the enter button, then place the controller inspection switch into the auto position.

### **Phase I & II Load-Weighing Device**

**With (100 or 125%) full load in car verify that the load weighing device does not interfere with Phase I [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.

### **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 [2.27.3.3.6]**

- 1) While the car is on Phase II, short to ground the HCP in the landing fixture.
- 2) The HCP fuse will clear.
- 3) Verify that Phase II operation remains unaffected.
- 4) Replace the HCP fuse.

### **Phase I & II 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 remain at its current position in the hoistway until the firefighter registers a car call. The car will then move to an available floor and stop. It will remain on Phase II at that landing until the firefighter enters a call.

## **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 LCD user interface 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.

## **Plunger Gripper**

**That 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.

## **Phase I under Special Conditions**

**That if Phase I is activated while elevator is responding to any of the devices listed in 3.27.1(a), (b), (c), or (d), the car will return to recall level or as specified in 3.27.1.**

While the car is at the top floor, **CAREFULLY** jump S10 terminal to LOS terminal. If a normally closed switch is used, then **CAREFULLY** remove the wire from the LOS terminal. This will initiate a low oil return or a plunger follower guide protection. For a hot oil condition, **CAREFULLY** remove the wire from the TPH-S1 terminal. This will initiate a hot oil 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 or replace the wire back, move the controller inspection switch to the inspection position, on the LCD user interface, push the up button to go to “RESET FAULTS”, push the enter button, push the up button to go to the “Reset Low Oil” or “Reset Hot Oil” and 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, **CAREFULLY** jump FEP terminal to EMP terminal. 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.

## **Phase I under Special Conditions**

**That if any of the devices listed in 3.27.1(a), (b), (c), or (d), are 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**

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, **CAREFULLY** jump S10 terminal to LOS terminal.

If a normally closed switch is used, then **CAREFULLY** remove the wire from the LOS terminal. This will initiate a low oil return or plunger follower guide protection. For a hot oil condition, **CAREFULLY** remove the wire from the TPH-S1 terminal. This will initiate a hot oil return. 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 place the wire back, move the controller inspection switch to the inspection position, on the LCD user interface push the up button to go to “RESET FAULTS”, push the enter button, push the up button to go to the “Reset Low Oil” or “Reset Hot Oil” and 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. While the car is returning, **CAREFULLY** jump FEP terminal to EMP terminal. 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.

### **Phase I under Special Conditions**

**That if any of the devices listed in 3.27.1(a), (b), (c), or (d), are activated while Phase I is in effect with the car at the recall level, the door will close per 3.27.3**

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, **CAREFULLY** jump S10 terminal to LOS terminal. If a normally closed switch is being used, then **CAREFULLY** remove the wire from the LOS terminal. This will initiate a low oil condition or plunger follower guide protection condition. For a hot oil condition, **CAREFULLY** remove the wire from the TPH-S1 terminal. This will initiate a hot oil condition. 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 user interface push the up button to go to “RESET FAULTS”, push the enter button, push the up button to go to the “Reset Low Oil” or “Reset Hot Oil” and 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, **CAREFULLY** jump FEP terminal to EMP terminal. 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.

## **Phase II under Special Conditions**

**That if any of the devices listed in 3.27.1(a), (b), (c), or (d), are activated while the car is on Phase II, the elevator will function as specified in 3.27.4**

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. **CAREFULLY** jump LC terminal to LOS terminal. If a normally closed switch is used, then **CAREFULLY** remove the wire from the LOS terminal. This will initiate a low oil condition or plunger follower guide protection condition. For a hot oil condition, **CAREFULLY** remove the wire from the TPH-S1 terminal. This will initiate a hot oil condition. 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 user interface push the up button to go to “RESET FAULTS”, push the enter button, push the up button to go to the “Reset Low Oil” or “Reset Hot Oil” and 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. **CAREFULLY** jump FEP terminal to EMP terminal. 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.

## **Plunger Follower Guide**

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

While the car is at the top floor, **CAREFULLY** jump S10 terminal to LOS terminal. If a normally closed switch is being used, then **CAREFULLY** remove the wire from the LOS terminal. This will initiate a plunger follower guide protection. 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 user interface push the up button to go to “RESET FAULTS”, push the enter button, push the up button to go to the “Reset Low Oil” push the enter button, then place the controller inspection switch into the auto position.

### **Switch for 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 user interface 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.

### **Pressure Switch**

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

If the pressure switch is normally closed:

While the car is at the top floor, **CAREFULLY** remove the wire from the LPS-S5 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, **CAREFULLY** reconnect the wire that was removed from the LPS-S5 terminal.

If the pressure switch is normally opened:

While the car is at the top floor, **CAREFULLY** install a temporary connection from the S10-S6 terminal to the LPS-S5 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, **CAREFULLY** remove the temporary connection from the S10-S6 terminal to the LPS-S5 terminal.

### **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 up.
- (b) With elevator stopped, reverse two feed lines and verify elevator will not run up.

### **Hot Oil Operation**

**When the temperature of the liquid in the hydraulic driving machine rises above its maximum operating temperature, the operation in [3.26.6.5] will occur.**

While the car is moving up, **CAREFULLY** remove the wire from the TPH-S1 terminal to simulate a rise in temperature, above the maximum operating temperature, of the liquid in the hydraulic driving machine. Verify that the elevator will stop and that power is removed from the hydraulic driving-machine motor. The hydraulic driving-machine motor shall not restart, and, when 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 car on machine room inspection and **CAREFULLY** reconnect the wire that was removed from the TPH-S1 terminal. From the LCD user interface, navigate to the “RESET FAULTS” menu and press enter. Navigate to the “Reset Hot Oil” menu and follow the instructions to reset this condition.

## **Emergency Power**

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

Were Applicable, simulate emergency power by jumping terminal FEP to terminal EMP. Make sure that the elevators comply with 2.27.2. To restore to normal operation, remove jumper from EMP terminal.

# End of Document.

Revision history.

- v 1.01      Removed “Test 1” test procedure for MC contactor on page 2 for across the line starters. Not required for soft starter application.
- v 1.02      Added verbiage to clear the HCP fuse in test El.6-153.20 on page 10.
- v 1.03      Added verbiage for hot oil condition on Phase I and Phase II Special Conditions on pages 11,12, and 13.
- v 1.04      Edited contact information on page 1.
- v 1.05      Updated code version and deleted reference to document "Specification Sheet Data for Hydraulic Elevators" No.: ED-09091 on page 2. Deleted references to “Specification Sheet Data for Hydraulic Elevators” No.: ED-09091 on remaining pages. Updated references to “LCD user interface”. Updated references to devices listed for code requirements 3.27.1(a),(b), (c), or (d) on pages 11, 12, and 13. Updated item “4” in “Phase I & II Power Off” on page 10.
- v 1.06      Added verbiage for “Hot Oil Operation” on page 14. Added verbiage for normally opened pressure switch on page 14.
- v 1.07      Added verbiage for 2010, and 2013 code revisions. Corrected code reference, 2.27.3.3.6, on page 10.
- v 1.08      Removed verbiage regarding HCP on page 10.
- v 1.09      Removed verbiage for NTSD test on page 9.
- v 1.10      Cosmetic edits for consistency with other similar documents. On top of page 2 added statement to include code versions that are applicable to this document.
- v 1.11      Added conditional changes to Test 5 for a 2-stop elevator with both a front and rear opening at either landing.