Endura
Inspector's Guide

ThyssenKrupp Elevator Americas

ThyssenKrupp

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Safety Precautions

IMPORTANT! **Read this page before any work is performed on elevator equipment. The procedures contained in this manual are intended for the use of qualified elevator personnel. In the interest of your personal safety and the safety of others, do not attempt any procedure that you are not qualified to perform.**

All procedures must be accomplished in accordance with the applicable rules in the latest edition of the National Electrical Code, the latest edition of ASME A17.1, and any governing local codes.

Terms in this Manual

CAUTION statements identify conditions that may result in damage to the equipment or other property if improper procedures are followed.

WARNING statements identify conditions that may result in personal injury if improper procedures are followed.

General Safety

Before applying power to the controller, check that all factory wire connections are tight on relays, contactors, fuse blocks, resistors, and terminals on cards and DIN rail terminals. Connections loosened during shipment may cause damage or intermittent operation.

Other specific warnings and cautions are found where applicable and do not appear in this summary. See the ThyssenKrupp Elevator Employees' Safety and Accident Prevention Program Manual and the Elevator Industry Field Employees' Safety Handbook for electrical equipment safety information on installation and service.

Mechanical Safety

See the ThyssenKrupp Elevator Employees' Safety and Accident Prevention Program Manual and the Elevator Industry Field Employees' Safety Handbook for mechanical equipment safety information on installation and service.

Electrical Safety

All wiring must be in accordance with the National Electrical Code and be consistent with all state and local codes.

Use the Proper Fuse

To avoid fire hazards, use only a fuse of the correct type, voltage, and current rating. See the job specific drawings sheet (Power Supplies) for fusing information.

Electric shocks can cause personal injury or loss of life. Circuit breakers, switches, and fuses may not disconnect all power to the equipment. Always refer to the wiring diagrams. Whether the AC supply is grounded or not, high voltage will be present at many points.

Printed Circuit Cards

Printed circuit boards may be damaged if removed or installed in the circuit while applying power. Before installation and/or removing printed circuit boards, secure all power.

Always store and ship printed circuit cards in separate static bags.

Mainline Disconnect

Unless otherwise directed, always Turn OFF, Lock, and Tag out the mainline disconnect to remove power from elevator equipment. Before proceeding, confirm that the equipment is de-energized with a volt meter. Refer to the ThyssenKrupp Elevator Employees' Safety and Accident Prevention Program Manual for the required procedure.

Test Equipment Safety

Always refer to manufacturers' instruction book for proper test equipment operation and adjustments.

Megger or buzzer-type continuity testers can damage electronic components. Connection of devices such as voltmeters on certain low level analog circuits may degrade electronic system performance. Always use a voltmeter with a minimum impedance of 1M Ohm/Volt. A digital voltmeter is recommended.

When Power Is On

To avoid personal injury, do not touch exposed electrical connections or components while power is ON.

Static Protection Guidelines

IMPORTANT! **Read this page before working with electronic circuit boards.**

Elevator control systems use a number of electronic cards to control various functions of the elevator. These cards have components that are extremely sensitive to static electricity and are susceptible to damage by static discharge.

Immediate and long-term operation of an electronic-based system depends upon the proper handling and shipping of its cards. For this reason, the factory bases warranty decisions on the guidelines below.

Handling

- Cards shipped from the factory in separate static bags must remain in the bags until time for installation.
- Anti-static protection devices, such as wrist straps with ground wire, are required when handling circuit boards.
- Cards must not be placed on any surface without adequate static protection.
- Only handle circuit cards by their edges, and only after discharging personal static electricity to a grounding source. DO NOT touch the components or traces on the circuit card.
- Extra care must be taken when handling individual, discrete components such as EPROMS (which do not have circuit card traces and components for suppression).

Shipping

- Complete the included board discrepancy sheet.
- Any card returned to the factory must be packaged in a static bag designed for the card.
- Any card returned to the factory must be packaged in a shipping carton designed for the card.
- "Peanuts" and styrofoam are unacceptable packing materials.

Note: Refer to the ThyssenKrupp Replacement Parts Catalog to order extra static bags and shipping cartons for each card.

Failure to adhere to the above guidelines will VOID the card warranty!

Arrival of Equipment

Receiving

Upon arrival of the equipment, inspect it for damage. Promptly report all visible damage to the carrier. All shipping damage claims must be filed with the carrier.

Storing

During storage in a warehouse or on the elevator job site, precautions should be taken to protect the equipment from dust, dirt, moisture, and temperature extremes.

Introduction

This guide has been developed as an aid for the inspector or authority having jurisdiction over such matters in the inspection and acceptance testing of this system. It is not intended to replace any other documentation that may be used, and it is not totally inclusive of all items required for an inspection test. Please read this entire document and if any information is unclear, contact the local ThyssenKrupp Elevator Office.

System Overview

The Endura MRL Hydraulic Elevator System is designed and produced to meet all relevant code requirements for ASME A17.1-2010/CSA B44-10 Safety Code for Elevators and Escalators. This system is based on the machine roomless concept and a distributed control design. The main parts of the system are:

- The signal fixtures are controlled through serial digital communications.
- The positioning system uses a metal tape that spans the hoistway using a car-mounted tape reader (selector) with a built-in digital encoder. This system includes speed and direction reporting, car position, leveling, door zone, normal travel limits, and terminal speed reduction/NTSD.
- The jack system can be a single or multistage telescoping system. Some systems will use the jack-positioning sensors. and synchronizing controls in the Endura MRL System's Software.
- Sensors, valves, and timers are designed into the system to control the monitoring of the system fluid pressure, the fluid level, and the fluid flow rate.

Overlapping Safety Systems

1. CPUA and Software
2. FPGA Logic (IOD)
3. Safety Processor and Software
4. Normal Terminal Slowdown Processor and Software

System Overview
(continued)

Safety Processor - Provides a second software system to perform A17.1 safety functions that prohibit unsafe operation due to failure of a single software system. This is an independent (from the main CPUA) processor that receives its own discrete and distributed inputs. It receives unique digital messages about the mode of the respective I/O from the HWA top and bottom nodes as well as the car top inspection node. The discrete inputs and encoder are wired in parallel to the main CPUA and the safety processor. Terminal Speed Reduction (TSR) is one of the key safety functions performed by the Safety Processor.

The Endura MRL System uses multiple processors in areas that have the capability to bypass an Emergency Protective Device (EPD). These devices become safety nodes to the system, and they send their I/O data in specific digital messages different from a standard fixture node. In most cases, twin signals (and the outputs that can override them) are generated from these EPD devices.

The twin signals have their own hardware. In order for them to be rendered ineffective, there has to be a dual failure in the twin signal hardware as well as a dual failure in the software system. Based on Code interpretations, the general requirements for these circuits are:

- No single failure can prevent the EPD from performing its specified functions.
- Before the elevator restarts, the procedures used to mitigate the failures described in the Code must be checked; Software systems can be used in these procedures if there is a hardware path to remove power from the motor and the brake/valves.

  For the hardware path, inputs for the bypassed EPD are fed into the FPGA Logic. For the software path, the inputs for the bypassed EPD are fed into the Safety Processor software system. Both the FPGA Logic and the Safety Processor software system have control of an output device in the safety circuit (known as a triac). Before every restart these outputs must be checked for proper operation by cycling the outputs while monitoring the input counterparts. If a failure is detected then the car cannot restart.

The Endura MRL has the capability to measure ambient temperature surrounding the IOD board which is located in the controller landing service panel. This calculation is monitored by the control system to determine if the controller is at a safe operating temperature. Elevator operation is either restricted or prevented if the system is outside the limits of normal operational range.

Inspection Procedures

Procedure Reference Material

The following procedures are provided for the Inspection of the Endura MRL System and do not differ significantly from the industry Inspection Guides for hydraulic elevator systems. The Endura MRL System is completely conventional as far as hydraulic elevator systems are concerned, and inspection procedures used on Endura MRL are no different than those used for other systems. For procedures not in this guide, please refer to the appropriate AMSE documentation.

Access and Egress Procedures

The Access and Egress Procedures that are used entering the hoistway determine whether or not power is needed to perform the required task(s). If not, Turn OFF, Lock, and Tag out the mainline disconnect.

Car Top Safety

Safety precautions when accessing/egressing car tops:

- Prior to opening the hoistway door, ensure that the correct hoistway has been selected and that the car is at the proper floor (to avoid a fall hazard).

  Note: Access car tops from the top terminal landing whenever possible.
- Never access a hoistway, unless a reliable method of controlling the car has been determined.
- Locate the emergency stop switch.
- Before accessing the car top, place the stop switch in the STOP position, and confirm the proper operation.
- Locate a safe refuge area.
- Always maintain control of the hoistways doors during access/egress.
- Check car top for oil or grease and clean as required prior to beginning work.

Safety precautions when working on car tops:

- Before beginning work, check the car top for oil or grease, and clean as required.
- Verify proper operation of the top-of-car inspection operating buttons. Where outlets are provided, use a grounded, portable light with a suitable, non-conductive; or grounded lamp guard and reflector.

Access and Egress Procedures *(continued)*

- Use the top-of-car operating device to operate the car; DO NOT use an operator in the car.
- If movement of the car is needed while on the car top, establish a firm hold on the crosshead or other parts of the car structure.
- Fall protection is to be used when a fall hazard exists. The only exception to this is when routine maintenance is being performed on top of complete, operational elevator cars, Do Not use fall protection where there is a greater risk of entanglement.
- When opening hoistway doors from the car top, do so slowly, so that no one steps in from the landing thinking a car has arrived.
- Observe overhead clearances.
- Use extra care when working on car tops that are curved, domed, or located in unenclosed hoistways.
- When egressing the hoistway/car top, ensure stop switch is in the STOP position, and that the inspection switch is on Inspection Operation.

WARNING

DO NOT turn these switches to Automatic Operation until the hoistway door interlock is open, remains open, and the hoistway is empty.

Pit Safety

Before entering a pit, ensure that every employee is aware of the hazards. Some common hazards are:

- Recognized refuge space
- Inadequate lighting
- Improper access
- Tripping hazards
- Improper use of pit ladders
- Moisture/water/oil
- Moving equipment

Access and Egress Procedures
(continued)

Before entering a pit, take appropriate steps to minimize the following hazards and any others that are identified:

- Obtain control of the car.
- Identify a refuge space.
- From the bottom landing place the car on inspection, using the hall access key switch raise the car high enough to allow for proper access to the pit. Turn the pit light on and push the pit switch to off. Turn the hall key access switch in both directions to ensure the car will not move, and remove the key. Enter the pit and install the pit prop. Get out of the pit, pull the pit stop switch to normal. Use the hall access key switch to slowly bump the car down until the car is landed on the pit prop.
- If movement of the elevator is not needed to complete the work being performed, Turn OFF, Lock, and Tag Out procedures are required.
- If notified by the building owner or representative that the pit and/or hoistway has been classified as a Permit Required Confined Space (this notification could be verbal or the pit/hoistway may be labeled), contact the appropriate person for authorization. In either case, DO NOT enter the pit/hoistway until you receive authorization.

Safety Precautions when Working in Pits

- Before entering the pit, test and verify the door lock circuit and stop switch circuit.
- Ensure that all portable lights and tools are connected through a ground fault (GFCI).
- Take care to protect all lighting from damage.
- DO NOT work in a pit with standing water.
- Before climbing, always examine shoes for oil/grease.
- Use both hands when working with ladders and when accessing/egressing the pit.
- Be aware of moving equipment (i.e., pump, motors, belts, and sheaves), and ensure that clothing and hands can not get caught in them.
- DO NOT smoke or have an open flame in the pit.
- DO NOT work in a pit without pit props.

Fault And Parameters

O16 - Low Fluid Door - During low fluid operation, this adjustment sets the selective doors to open when returning to a landing.

Unit	Range	Default
F/R	0-1	0

Values: 0 Front 1 Rear

O17 - Low Fluid Timer - This adjustment sets how long the motor is allowed to run before activating the low fluid operation.

Unit	Range	Default
sec.	20-255	100

Note: If the floor-to-floor run time exceeds the timer value, the low fluid operation actives.

Z44 - UP Stall Timer (Required by California) - This adjustment will set a timer that will quickly detect a stalled UP Run.

Unit	Range	Default
0.1 sec.	1-100	20

This timer is intended to prevent faults such as:

- A motor burn-out (in the event of a motor phase reversal).
- Running Up after the rupture valve has activated (to prevent emptying the tank).

1042 - Viscosity Shutdown (due to over temperature) - The OLTO input is/was active.

1074 - Low Jack Pressure

1110 - A17/B44 Shutdown Error - Inspection to reset.

1150 - Up Run Stalled - Due to a Command to Run Up, but no encoder pulses were detected with Z44

1741 - Speed monitoring Relay Fault MRLH.

Inspection Tests

Notes:

- Both the shut off valve and the APU require power from either the CONTROL POWER or the AUX POWER cord.
- The APU requires the STOP button on the service panel to be pushed in to operate.
- The following items are located behind the controller landing service panel.
  - IOD Board
  - CPUA
  - UIT

Electronic Shutoff Valve

1. Position the car at the first floor landing.
2. Place the car on Controller Inspection Operation by moving the switch on the IOD from NORMAL to INSP.
3. Activate the Shut Off Valve by turning the Shut Off Valve Key Switch, located in the service panel, to the Close position (11 to 13 sec. red LED on).
4. Run the car up until it bypasses oil, while observing that the car does not move or run up.
5. Open the shut off valve by turning the key to the open position and holding for approximately 11 - 13 seconds until the OPEN LED illuminates.
6. Return the car to Normal Operation.

Lowering Valve

1. Position the car at the first floor landing.
2. Place the car on Controller Inspection Operation by moving the switch on the IOD from NORMAL to INSP.
3. Push the Stop Switch in the Service Panel.
4. Turn the Manual Lowering Key Switch to the Down position and hold for a few seconds.
5. Manual open the doors.
6. Observe the following:
   - The Position Count on the UIT is counting down.
   - The car has moved and is now below the floor level.
7. Pull the Stop Switch and return the car to Normal Operation.

Pressure Transducer (UIT display of Pressure)

1. Access the Pit using proper Access procedures in the Access and Egress section.
2. Connect a pressure gauge to the valve.
3. Compare the pressure gauge reading from the pit to the pressure reading on the UIT. Readings should be the same.
4. Return the car to Normal Operation.

Pressure Transducer

1. Position the car at the first floor landing.
2. Activate the Lowering Valve by pushing in the Stop Switch in the Service Panel.
3. Turn and Hold the manual Operation Key Switch in the down position.
4. Allow the car to sit on the buffers.
5. Observe the pressure on the UIT.
6. After the pressure drops, the system status will go on Low Pressure, shut down and display a 1074 fault.
7. Pull the Stop Switch and return the car to Normal Operation.

Top Terminal Slowdown Test (NTSD), Terminal Speed Reducing Device

1. Place the car on Controller Inspection Operation by moving the switch on the IOD from NORMAL to INSP, and level at a floor other than the top terminal.
2. Have ThyssenKrupp Elevator personnel inhibit the normal tape derived slowdown function to force the system to use the backup terminal slowdown function.
3. Scroll to Block Select Adjustments ⇒ Adjust Car/ Group ⇒ Position System ⇒ P17, and press Enter to edit value.
4. Press ⇑ or ⇓ to adjust P17 to one-half of the value. Do not SAVE to Flash.
5. Place the car on Automatic Operation and make a full speed run into the top terminal landing.

Notes:

- The car should stop within the leveling zone, producing system faults.
- The car should operate on Automatic. If the car stops outside of the Relevel Zone, the NTSD slowdown magnets are not properly placed.

6. Restore the normal tape derived slowdown function by pressing the Reset button on the CPUA card. This action will restore P17 to the original as-adjusted saved value. .

Bottom Terminal Slowdown Test (NTSD), Terminal Speed Reducing Device

1. Place the car on Controller Inspection Operation by moving the switch on the IOD from NORMAL to INSP, and level at a floor other than the bottom terminal.
2. From the UIT, scroll to Block Select Adjustments ⇒ Adjust Car/ Group ⇒ Position System ⇒ P18, and press Enter to edit value.
3. Press ⇑ or ⇓ to adjust P18 to one-half of the value. Do not SAVE to Flash.
4. Place the car on Automatic Operation and make a full speed run into the top terminal landing.

Notes:

- The car should stop within the leveling zone, producing system faults.
- The car should operate on Automatic. If the car stops outside of the Relevel Zone, the NTSD slowdown magnets are not properly placed.

5. Restore the normal tape derived slowdown function by pressing the Reset button the CPUA Card. This action will restore P18 to the original as-adjusted saved value.

Low Oil Protection Test

The Endura MRL Controller uses a motor/pump driven timer to protect against a low oil condition (or any other condition that results in an excessive runtime).

1. Place the car on Automatic at the second floor (or the bottom floor on a two-stop job).
2. Place a car call for the top terminal landing.

Notes:

- The motor and valve should energize.
- After a sufficient time (set by timer adjustment O17), the motor should shut off and the car should lower to the bottom terminal floor.

3. From the UIT--Block Select Adjustments ⇓ Adjust Car/Group ⇓ Options and scroll to O17. Press Enter and use ⇑ or ⇓ to make changes. Do not WRT the changes. Note the lower the O17 number the faster the test will conclude
4. Have ThyssenKrupp Elevator personnel inhibit up run capability by removing CON15 from the IOD board.
5. After a fault is registered and the car stops running, re-insert CON15 on the IOD board.

Low Oil Protection Test
(continued)

6. Observe the car lowering to the bottom terminal floor and opening the doors (front or rear, as selected by adjustment O16 located in the options section of the adjust car/ group sub menu). The door open button in the car should be operable, but the elevator should be shutdown.
7. Cycle the power by pressing the Reset button on the CPUA card.

Valve High Pressure Relief Test (Stop Ring Test)

This test allows the car to be run onto the jack system's stop ring to force the valve into high pressure relief. The system pressure is displayed on the UIT which is located on the CPUA. This allows for the confirmation of the relief pressure.

1. With the car on Automatic Operation, position it level at the top floor.
2. After the doors close, place the system on Controller Inspection Operation (Inspection Switch on the IOD card).
3. Install a temporary jumper on the IOD card at CON47, pins 2 to 3. This action bypasses the NP Microprocessor's safety string control output.
4. Run the car UP until it stops on the directional limit magnet.
5. Access the PRT command through the UIT. Adjustments ⇒ Adjust Car ⇒ Startup Menu: Press ENTER ⇓ PRT.
6. Press escape until BLOCK SELECT ADJUSTMENTS, then ⇒ until LOG OFF UIT appears.
7. Press ENTER to return to default window screen that displays the pressure reading screen.

Note: For the Pressure Relief Test Command to be accepted, the car must be on Inspection and also on the directional limit.

8. Run the car UP until the car contacts the stop ring, and the valve goes into high pressure relief.
9. Note the pressure reading on the UIT.

CAUTION

Immediately stop the power unit if the oil pressure exceeds 750 PSI.

10. After the test is complete:
    a. Run the car DOWN to the top floor level on Inspection Operation or at least off of the directional limit magnet.
    b. Remove temporary jumper, CON47, installed in step 3.
    c. Return the car to Automatic Operation.

Overspeed Valve Test

WARNING

Do not allow personnel to remain in the pit when the car is running.

This test verifies the function and controller response of the oil line overspeed valve by forcing the valve to activate.

1. Verify that Z44 Timer defaults to 2 seconds.

Note: The lower the timer is set, the quicker the system will shut off upon overspeed valve activation. The suggested set time is two to four seconds.

2. Place a full load on the cab.

Note: The more load that is present on the cab the less adjustment is needed to force the overspeed valve activation.

3. Position the car on Controller Inspection Operation by moving the switch on the IOD from NORMAL to INSP at an upper floor.
4. Enter the pit while pushing the Pit Stop Switch.
5. Place the Pit Post(s) into the buffer stand.
6. Have the mechanic turn IN one full turn on the overspeed valve adjustment T-handle.
7. Remove the pit post and exit the pit while pulling the pit stop switch.
8. Place the car on Automatic Operation.
9. Place a call below the car's position.
   - When the overspeed valve activates, car motion will stop.
   - A 1074 Fault is registered, and the system moves to Checked Redundancy Shutdown (CKR SHUTD) Operation status.
   - The CPUA attempts to use the motor/pump to re-pressurize the jack.
   - Once the motor starts, the CPUA attempts to energize the UP valve solenoid and Timer Z starts.
   - When Timer Z expires, the motor/pump and valve shuts down, Fault 1123 is registered, and the system is shutdown on Run Monitor (RUN MONTR) Service.

Note: If the valve does not set, repeat step 3 through step 9.

Overspeed Valve Test
(continued)

10. Reset the system.
    a. Cycle the car operation from Automatic, then quickly revert back to Controller Inspection Operation.
    b. Run the car UP. This action re-sets the overspeed valve.
    c. Turn the T-Handle in one turn before adding the seal.
    d. Verify the valve will not set by making several runs from the top to the bottom with a full load.
    e. Clear all faults, and return the car to service.

Run Stall Timer Protection Test (Up Direction)

The Controller uses a motor/pump driven timer to protect against a stalled car condition.

1. Place the car on Automatic Operation at the bottom floor.
2. Inhibit the UP run capability by removing Con15 from the IOD Card, located in the controller landing service panel.
3. Place a car call for the top terminal landing.

Notes:

- The motor should remain energized, but the control valve should not.
- After a sufficient time (set by timer adjustment Z44), the motor should shut off, the controller should register a 1150 Fault, and Run Monitor should display as the control status.

4. Replace Con15 on the IOD Card, and cycle the inspection switch in the controller to re-set the Run Monitor Fault condition.

Car Emergency Signal Test

This test verifies the emergency power source (battery) has an output rating that operates all emergency lights, alarms, and two-way communication equipment.

1. In the car, verify the functions of the emergency lights, the alarms, and the two-way communication equipment.
2. Place the car at the controller landing for easy access to the mainline disconnect located behind the controller landing disconnect panel.
3. Remove the car from service.
4. Place the car doors in the open position, and, if necessary, block the doors to prevent them from being closed by the hoistway door closing device.
5. Turn OFF, Lock, and Tag out the mainline disconnect.
6. Turn OFF the 120VAC car light, fan, and emergency lighting circuit located behind the controller landing disconnect panel.
7. Return to the car and verify that the emergency lights, alarms, and two-way communication equipment functions on the emergency power source (battery).
8. Turn ON the mainline disconnect.
9. Turn ON the 120VAC car light, fan, and emergency lighting circuit.
10. Verify proper operation, and return the car to service.

Low Pressure Switch Test

CAUTION

Before beginning this procedure, verify that the Valve High Pressure Relief Test (Stop Ring Test) on page 13 has been performed.

Endura MRL Controllers include a Pressure transducer installed in the system piping and is monitored by the system CPU. Upon a loss of pressure, the CPU will inhibit normal down running.

1. Place the car on Automatic Operation at any floor other than the bottom terminal.

CAUTION

Close the shut off valve to the jacks.

2. From the service panel behind the service door, insert the Control Power plug into the receptacle between the two plugs.
3. Turn the key switch for the remote shut off valve to the closed position. Hold in the closed position until the CLOSED LED lights up. it will take approximately 12 seconds.

Low Pressure Switch Test *(continued)*

4. Place a car call to the bottom floor. The car should not run, and Fault Codes 1074 and 1110 are logged.
5. Re-level is permitted. Use the Run Stall Timer (Z44) to shut the car down if it fails to re-level Up.
6. Place the Controller Inspection Switch to INSP.
7. Run the car Up (to recharge the jack line) until the valve goes into high pressure relief, and repressurize the jack line.
8. Turn the key switch for the shut off valve to the open position.
9. Hold in the open position until the OPEN LED lights up. This will take approximately 12 seconds
10. Return the car to Automatic Operation.

Oil Temperature – Over Temperature Sensor Test

The Controller will include a temperature sensor to determine if the oil exceeds acceptable operating temperatures. The OLTO (over-temp) sensor input opens when reaching the predetermined set point at approximately 170 degrees F.

1. With the car on Automatic Operation at the bottom landing, place an Up call to the top floor.
2. After the car begins to run Up, force the OLTO input inactive (metered logic) by disconnecting Con 23-3 on the IOD Card.
3. Verify that the system registers a Speed monitoring Relay Fault MRLH (1741), and a Viscosity Shutdown Fault, due to over temperature (1042).
4. After the 1042 Fault is registered, clear the OLTO forced state by replacing Con23-3 on the IOD Card (OLTO wire).
5. Verify that the motor is de-energized.
   - The elevator will lower to the lowest landing.
   - The doors open, then close once, at the lowest landing.
6. Verify that the elevator will not respond to an Up car or hall call.
7. After the door closes, verify that the door open push button will reopen the door.
8. Clear faults and cycle the Controller Inspection switch to return the car to automatic operation.
9. Verify proper operation, and return the car to service.

Flooded Pit Test

1. Block Select Adjustments ⇒ Adjust Car/ Group ⇒, and use ⇑ or ⇓ to scroll to the Homing and Shutdown screen (H adjustments).
2. Press ENTER on the UIT.
3. Use ⇑ or ⇓ to set the following parameters. Press enter to select the parameter
   - H17 to 2 - Flooded pit return floor.
   - H18 to the appropriate door to open once at return floor.
   - H21 to 100 - Time door is open at return floor
4. Press Escape until the BLOCK SELECT ADJUSTMENTS screen is shown.
5. Press ⇒ until the BLOCK SELECT STARTUP WIZARD screen is shown.
6. Press.⇓ το START UP WIZARD.
7. Press.⇓ to SAVE TO FLASH and then press Enter.
8. Place the car on Automatic at the first floor.
9. Apply G24 to CON 36 Pin 5.
10. The car will go on Flooded Pit Operation and the following will occur:
    - Run to the second floor or floor designated.
    - Cycle the doors.
    - After the car returns to the return landing, the shunt breaker will trip, removing all power to the controller.

APU Relief Test

CAUTION

Before beginning this procedure, verify that the Valve High Pressure Relief Test (Stop Ring Test) on page 13 has been performed.

Note: The UIT screen must be at the default screen that displays the System Pressure

1. Position the car at the 1st landing.
2. Place the car on Controller Inspection Operation by moving the switch on the IOD from NORMAL to INSP.
3. From the service panel behind the service door, insert the Control Power plug into the receptacle between the two plugs. This will power the APU when the Stop Switch is pushed in.

APU Relief Test
(continued)

4. Close the shutoff valve by using the key located on the service panel. Turn to CLOSE and hold for approximately12 seconds. The CLOSE LED will illuminate when fully closed.
5. Push IN the Stop Switch located on the service panel.
6. From the AUX Operation key switch, turn the key to the UP position while observing the Pressure displayed on the UIT.

Note: The pressure is Factory "set" to relief at 330 PSI.

7. The test is now complete.
8. Open the Shutoff Valve by turning the key and holding in the OPEN position for approximately 12 seconds until the OPEN LED illuminates.
9. Unplug the power plug from the service panel and pull out the Stop Switch.
10. Move the switch on the IOD from the INSP to the NORMAL position. The car is now on automatic.

Rath Phone Monitoring

This procedure will demonstrate Code compliance for cab phone line loss detection and alarms. The Rath phone unit should already be programmed and set up for use per the instructions included with each Rath phone in the car station.

Prior to Inspection demonstration, ensure that the Rath phone is programmed with a 10 minute value (default) for the Phone Line Detection Timer. On the Rath phone: Press "Enter", then "3" then "4", then "Enter", then "0010", the press "Stop" for 3 seconds.

AHJ Inspection Procedure

1. Disconnect the active building phone line from phone unit in the car station. The system will check for an active phone line every 10 minutes (factory default).
   - If an active phone line is not detected the system will make a second check in 60 seconds and a third check 60 seconds after that.
   - If an active phone line is not detected after the third check, the buzzer and indicator in the hall station will activate.

   Note: The additional second and third line checks are to prevent false and momentary phone line interruptions from activating the alarms).

Rath Phone Monitoring *(continued)*

2. Reconnect the active phone line to the phone unit in car station once the alarms have activated.

Note: Once a non-active phone line has been detected by the system, it will check every 60 seconds for an active phone line. If an active phone line is detected the hall station buzzer and indicator will automatically deactivate.

Hall Station Devices

1. To temporarily silence the buzzer per A17.1 (2.27.1.1.6), use the Phone Buzzer key switch to Reset.

Note: The Buzzer will sound again in 18 hours if an active phone line is not restored.

2. The Indicator will remain active until an active phone line is restored.

Battery Lowering

1. Verify the following adjustments:
   - E10 set to 1 = Type-0 (Battery Lowering) - Emergency power type
   - E11 set to the appropriate floor – Emergency Power Return Floor
   - E12 set to the appropriate door – Emergency Power Door
2. Remove CON17 plug from the IOD board and jumper the CON17 MTA header pins 1&2 – EPD1 to EPD2.
3. Turn Off, Lock, and Tag out the mainline disconnect located behind the circuit breaker door in the second floor door jamb.
4. Car should lower to the designated landing and cycle the door.
5. The Door Open Button will remain functional until the Battery unit shuts down.
6. Remove the CONN 17 jumper and return the original plug to CONN 17 on the IOD.
7. Turn On the Mainline Disconnect.
8. Verify proper operation, and return the car to service.

Periodic Inspection and Yearly Tests

The Endura MRL Controller may be examined and tested periodically in the same manner as any other controller. The items that are specific to this design are covered in the previous section of this document. These procedures may be used, if required, for periodic examinations and tests.

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