C4 TRACTION

TESTING PROCEDURES

VERSION 3.06

SMARTRISE

Date	Version	Summary of Changes
May 28, 2025	3.06	Reviewed the Machine Roomless (MRL) Car Safety test.
May 20, 2025	3.05	Reviewed the M1000 drive setup in the Ascending Car Overspeed Detections Means and Emergency Brake test and in the Car Safeties and Governor test.
May 5, 2025	3.04	Added the Machine Roomless (MRL) Car Safety test.
April 29, 2025	3.03	Reverted the Car Safeties and Governor test to v3.01.
April 22, 2025	3.02	Reviewed the Car Safeties and Governor test.
April 15, 2025	3.01	Added a note to clear active alarms and faults before performing test.
April 9, 2025	3.0	Updated template and reviewed testing procedures.
March 24, 2025	2.0	Reviewed the testing procedures.
March 18, 2025	1.30	Reviewed the Normal Terminal Stopping Device (NTSD) test.
March 7, 2025	1.29	Reviewed tests requiring action on M, B1, and B2 contactors to cover hoistway enclosure locations.
March 3, 2025	1.28	Added the Testing Under Excess Load with a Load Weighing Device Present. Reviewed the FEO Phase I and Load Weighing Device test. Reviewed the FEO Phase II and Load Weighing Device test.
January 13, 2025	1.27	Reviewed the Gate Switch Open Outside of Door Zone test.
October 9, 2024	1.26	Reviewed the Door Zone test. Reviewed the Door Zone Stuck High and Unintended Car Movement test.
September 23, 2024	1.25	Split the Contactor Feedback test into two tests - contactors mounted inside machine room enclosure & contactors mounted inside hoistway enclosure. Reviewed the Gate Switch not in Bypass Mode test. Reviewed the Door Zone Stuck High with Doors Open test. Reviewed the Door Zone Input Stuck High Outside of Actual Door Zone test. Reviewed the Door Zone Stuck High In-Flight test.
September 9, 2024	1.24	Updated the Direction Counter Trip Reset test.
June 17, 2024	1.23	Replaced “S-curve” with “Digital S-curve Technology ™ (U.S. Patent Pending)”.
June 3, 2024	1.22	Reviewed schematic locations.
May 10, 2024	1.21	Updated schematic locations.
April 18, 2024	1.20	Reviewed the expected results under the In-Car Stop Switch in Bypass Mode test & deleted the Troubleshooting Procedure.
March 13, 2024	1.19	Updated the expected results under the Gate switch Open Outside of Door Zone test.
February 14, 2024	1.18	Added the Direction Counter Trip Reset test.
January 5, 2024	1.17	Changed A17.1/B44-19 to A17.1 Added the In-Car Stop Switch not in Bypass Mode test. Added the In-Car Stop Switch in Bypass Mode test.
December 6, 2023	1.16	Added the Door Zone Stuck High with Doors Open Test Added the Door Zone Stuck High In-Flight Test

Date	Version	Summary of Changes
		Added the Door Zone Test Added the SFM and SFP Relays Pre-Flight Test.
November 17, 2023	1.15A	Modified A17.1/B44-10 to A17.1/B44-19. Reworded sections 2.3, 2.4.1 and 4.2. Removed section In-Car Stop Switch in Bypass Mode test.
November 10, 2023	1.15	Updated document presentation. Added Door Zone Stuck High and Unintended Car Movement test. Added Door Zone Input Stuck High Test.
January 25, 2023	1.14E	ETSL testing revision.
May 18, 2022	1.14D	Restored Brake Board Feedback test. Updated Safety String to Ground test. Updated Loss of Traction test.
October 28, 2021	1.14C	Added Manual Rescue test.
October 14, 2021	1.14B	Moved Hoistway Side Switch under FEO. Modified Gate Switch Open Outside of Door Zone test. Modified In-Car Stop Switch in Bypass Mode test.
July 14, 2021	1.14A	Updated reference for Gate Switch Open Outside of Door Zone test. Changed name of Hoistway Landing Slide Power to REF test to Hoistway Landing Side Power to REF test.
March 10, 2021	1.14	Added extra step to Safeties and Governor test to bump up car in Construction Mode. Updated NTSD display expectations.
January 22, 2021	1.13	Deleted Brake Board Feedback test.
January 7, 2021	1.12	Updated the MR display message on the NTSD procedure.
June 29, 2020	1.11	Added manual door instructions. Modified Loss of Traction test to test for exceeding speed threshold.
February 7, 2020	1.10	Modified Gate Switch Open Outside of Door Zone test procedure by stating the car remains in a faulted state until the controller is reset. Modified Loss of Traction test procedure by changing the DIP switch position to ON. Added settings are specific per job to the Loss of Traction troubleshooting procedure.
January 6, 2020	1.9	Corrected Load Weigh instructions for fire testing.
December 16, 2019	1.8	Modified Contactor test procedures. Added Loss of Traction troubleshooting procedure.
November 25, 2019	1.7	Clarified brake slide test – separated primary and secondary brake tests. Modified the test procedures for Unintended Car Movement. Detection Means and Emergency Brake Test by deleting hardware setup, setting and resetting parameters on and off during test, and update test procedure accordingly. Moved emergency terminal stopping device information from NTSD to ETSD. Requires controller Version 1.02.63r0 and above.

Date	Version	Summary of Changes
July 23, 2019	1.6	Deleted modified by and status columns on Document History page. Modified Unintended Movement instructions. Capitalized REF on Modified ETD to REF test and Hoistway. Landing Slide Power to REF test.
March 29, 2019	1.5	Added Unintended Movement instructions for high gear motors. Updated cover page Updated document presentation.
March 5, 2019	1.4	Updated M1000 overspeed instructions
September 25, 2018	1.3	Added instructions to hold brakes for A/D, Brake feedback, and slide.
September 12, 2018	1.2	Added: EBrake slide test. Ability to hold brake open for ascending and descending overspeed test.
August 20, 2018	1.1	Updated Software version to 1.02.50. Removed Drive speed modifications for ETSL test.
August 7, 2018	1.0	Initial Submittal.

Table of Tables

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1 C4 Test Procedure Introduction

This manual provides information for C4 Controller Software Version 1.02.58 and later.

ENSURE THAT ALL ACTIVE FAULTS AND ALARMS ARE CLEARED BEFORE PERFORMING THE TESTS.

1.1 Safety

The following safety measures are to be followed:

- Tests are to be performed by a qualified elevator mechanic only.
- Be certain that there are no passengers inside the elevator car when performing these tests.
- When performing a test that requires open doors, be sure to have proper personnel guarding the doors.
- When making hardware changes, be certain that all power has been disconnected from the elevator controller.

WARNING!
FAILURE TO FOLLOW PROPER PRECAUTIONS CAN RESULT IN SERIOUS INJURY, DEATH, OR DAMAGE TO THE ELEVATOR AND/OR BUILDING.

1.2 Test Procedure Format

Each test procedure in this document follows the format shown below:

- **Applicable Codes –** Sections of ASME A17.1 relevant to the test.
- **Schematic Location –** Corresponding locations in the job schematics.
- **Testing Notes –** Important considerations when performing the test.

The table below outlines the layout of the testing procedures.

Table 1: Layout of Testing Procedures

Phase	Testing Procedure
Setup	**Hardware** - Required hardware modifications for the test. **Software** - Required software modifications for the test. **Drive** - Required drive modifications for the test. **Car** - Required car modifications for the test.
Procedure	- Step-by-step Instructions for performing the test.

Expected Results	- The intended outcome of the test.
Revert	**Hardware** - Steps to restore hardware to normal. **Software** - Steps to restore software to normal. **Drive** - Steps to restore drive settings to normal. **Car** - Steps to retore car setting to normal.

The table below outlines the layout of the troubleshooting procedures.

Table 2: Layout of Troubleshooting Procedures

Failure	Troubleshooting Procedure
Description of Failure	- Steps to resolve issues.

2 Software/Hardware Monitored Electronic Protective Devices

The sections below outline the test procedures related to Software and Hardware Monitored Electronic Protective Devices.

2.1 Interlocks

The sections below outline the Interlocks test procedures.

2.1.1 Interlocks Not in Bypass Mode

The following test procedure applies to the Interlocks Not in Bypass Mode.

- **Applicable Codes –** ASME A17.1 sections 2.12.2.3 and 2.26.2.14
- **Schematic Location –** Interlock Contacts input feeder – MR SRU board – (1.E,1.F); SFM & SFP – MR SRU board – (5.G)
- **Testing Notes –** This test must be performed for all three Interlocks (Bottom, Middle, and Top).

The table below outlines the step-by-step procedure for testing the Interlocks Not in Bypass Mode.

Table 3: Interlocks Not in Bypass Mode Test

Phase	Testing Procedure
Setup	**Hardware** - If the interlock can be opened from outside the landing door, no hardware modifications are needed. - If the interlock cannot be opened from outside the landing door, locate the corresponding interlock wire connected to the Machine Room (MR) board. Be prepared to remove the wire during the test.
Procedure	- While the car is running, open an interlock or disconnect the interlock wire from the MR board. This can be done in any mode of operation when the interlock is not bypassed.
Expected Results	- After the Lock Clip Delay (adjustable parameter 16-0876, max 255 ms) expires, relays SFM and SFP should drop, the safety string should open, and the car should stop.
Revert	**Hardware** - Restore any removed wires.

2.1.2 Interlocks in Bypass Mode

The following test procedure applies to the Interlocks in Bypass Mode.

- **Applicable Codes –** ASME A17.1 sections 2.12.2.3 and 2.26.2.14
- **Schematic Location –** NA
- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the Interlocks in Bypass Mode.

Table 4: Interlocks in Bypass Mode Test

Phase	Testing Procedure
Setup	**Hardware** - Place the Hoistway Door Bypass switch in the OFF position. **Software** - Place the car in Automatic, Machine Room Inspection, or Hoistway Access operation.
Procedure	- While the car is running, place the Hoistway Door Bypass switch in the BYPASS position.
Expected Results	- The car should immediately come to a stop.
Revert	**Hardware** - Place the Hoistway Door Bypass switch in the OFF position.

The table below lists the troubleshooting procedures for the Interlocks in Bypass Mode test.

Table 5: Interlocks in Bypass Mode Troubleshooting Procedures

Failure	Troubleshooting Procedure
The car failed to stop	- Verify that the switch status is changing states by navigating to **Main Menu | Status | Inputs | Inspection | BYP Hall Door**.

2.2 Gate Switch

The sections below outline the Gate Switch test procedures.

2.2.1 Gate Switch Not in Bypass Mode

The following test procedure applies to the Gate Switch Not in Bypass Mode.

- **Applicable Codes –** ASME A17.1 sections 2.14.4.2.3 and 2.26.2.15
- **Schematic Location –** Front and Rear Gate Switch Contact input feeder – CT SRU board – (4.C) – inputs 501 (F), 502 (R); SFM & SFP – MR SRU board – (5.G); 24V (PWR) – MR SRU board – (5.C)
- **Testing Notes –** This test must be performed for both the Front and Rear Gate Switches, if applicable.

The table below outlines the step-by-step procedure for testing the Gate Switch Not in Bypass Mode.

Table 6: Gate Switch Not in Bypass Mode Test

Phase	Testing Procedure
Setup	**Software/ Hardware** - In Inspection mode, locate the appropriate Gate Switch wire coming into the Car Top (CT) board input terminal. - Disconnect the Gate Switch input from the sensor on the CT board. - Use a spare/unused wire from the Traveler cable to connect to the Gate Switch input on the CT board.

	- Go to the machine room, take the same spare/unused Traveler wire, and connect it to an available M24 terminal.
Procedure	- Place the car in Automatic mode. - While the car is running, remove the Gate Switch wire connected to the MR board.
Expected Results	- Relays SFM and SFP should immediately drop, the safety string should open, and the car should stop.
Revert	**Hardware** - Reconnect the Gate Switch wire to the CT board.

2.2.2 Gate Switch in Bypass Mode

The following test procedure applies to the Gate Switch in Bypass Mode.

- **Applicable Codes –** ASME A17.1 sections 2.14.4.2.3 and 2.26.2.15
- **Schematic Location –** Front and Rear Gate Switch Contact input feeder – CT SRU board – (4.C) – inputs 501 (F), 502 (R)
- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the Gate Switch in Bypass Mode.

Table 7: Gate Switch in Bypass Mode Test

Phase	Testing Procedure
Setup	**Hardware** - Place the Car Door Bypass switch in the OFF position. **Software** - Place the car in Automatic, Machine Room Inspection, or Hoistway Access operation.
Procedure	- While the car is running, place the Car Door Bypass switch in the BYPASS position.
Expected Results	- The car should immediately come to a stop.
Revert	**Hardware** - Place the Car Door Bypass switch in the OFF position.

2.2.3 Gate Switch Open Outside of Door Zone

The following test procedure applies to the Gate Switch Open Outside of Door Zone.

- **Applicable Codes –** ASME A17.1 sections 2.14.4.2.3 and 2.26.2.15
- **Schematic Location –** NA
- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the Gate Switch Open Outside of Door Zone.

Table 8: Gate Switch Open Outside of Door Zone Test

Phase	Testing Procedure
Setup	- NA
Procedure	- Place the car in IC Inspection mode. - Place the C and H-Door Bypass switches in the BYPASS position. - Move the car away from the door zone. - Set parameter 01-0151 to ON to allow the doors to open outside the door zone in Inspection mode. - Manually open the doors via **Debug | Enter Door Command | Open.** - Place the C and H-Door Bypass switches in the OFF position. A fault should appear at this point. - Return the car to Normal operation.
Expected Results	- As long as the doors are in the open position, the driving machine should remain inoperable.
Revert	**Software** - Set parameter 01-0151 to OFF.

2.3 In-Car Stop Switch

The sections below outline the In-Car Stop Switch test procedures.

2.3.1 In-Car Stop Switch Not in Bypass Mode

The following test procedure applies to the In-Car Stop Switch Not in Bypass Mode.

- **Applicable Codes –** ASME A17.1 section 2.26.2.21
- **Schematic Location –** In-Car Stop Switch Contact input feeder – COP SRU board – (3.C); SFM & SFP – MR SRU board – (5.G)
- **Testing Notes –** This test can't be performed on Firefighters' Emergency Operation (FEO) Recall.

The table below outlines the step-by-step procedure for testing the In-Car Stop Switch Not in Bypass Mode.

Table 9: In-Car Stop Switch Not in Bypass Mode Test

Phase	Testing Procedure
Setup	**Car** - Be prepared to activate the In-Car Stop Switch.
Procedure	- While the car is running, activate the In-Car Stop Switch.
Expected Results	- Relays SFM and SFP should drop, the safety string should open, and the car should stop.
Revert	**Car** - Deactivate the In-Car Stop Switch.

2.3.2 In-Car Stop Switch in Bypass Mode

The following test procedure applies to the In-Car Stop Switch in Bypass Mode.

- **Applicable Codes –** ASME A17.1 sections 2.26.2.21 and 2.27.31.6(c)

- **Schematic Location –** In-Car Stop Switch Contact input feeder – COP SRU board – (3.C); SFM & SFP – MR SRU board – (5.G)

- **Testing Notes –** The In-Car Stop switch is bypassed only during the initial FEO recall after the doors have closed and the car has started moving. FEO Phase II recall is not included in this test.

The table below outlines the step-by-step procedure for testing the In-Car Stop Switch in Bypass Mode.

Table 10: In-Car Stop Switch in Bypass Mode Test

Phase	Testing Procedure
Setup	**Car** - Be prepared to activate the In-Car Stop Switch. - Place the car far away from the FEO main recall landing and be prepared to place it in FEO recall.
Procedure	- Place the car in FEO recall. - Once the car begins recalling, activate the In-Car Stop Switch.
Expected Results	- Relays SFM and SFP should not drop, the safety string should not open, and the car should continue running.
Revert	**Car** - Deactivate the In-Car Stop Switch. - Reset the FEO.

2.4 Door Zone Sensor Failure

The sections below outline the Door Zone (DZ) Sensor Failure test procedures.

2.4.1 Door Zone Stuck High with Doors Open

The following test procedure applies to the Door Zone Stuck High with Doors Open.

- **Applicable Codes –** ASME A17.1 section 2.26.9.3.1

- **Schematic Location –** Door Zone Sensor input feeder – CT SRU board – (4.C,5.C); 24V (PWR) – MR SRU board – (5.C)

- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the Door Zone Stuck High with Doors Open.

Table 11: Door Zone Stuck High with Doors Open Test

Phase	Testing Procedure
Setup	**Software/ Hardware** - In Inspection mode, disconnect the DZ input from the sensor on the CT board. - Use a spare/unused wire from the Traveler cable to connect to the DZ input on the CT board. - Go to the machine room, take the same spare/unused Traveler wire, and connect it to an available M24 terminal.

Procedure	- Place the car in Automatic mode. - Position the car inside the Door Zone. - Place a Car Call or a Hall Call. - Open the hall door and/or in-car door while the car is moving outside of the Door Zone.
Expected Results	- The car should fault and come to a stop. - All Hall/Car Calls should be cleared.
Revert	**Hardware** - Disconnect +24V from DZ, then restore all wires to their original positions.

2.4.2 Door Zone Stuck High Outside of Actual Door Zone

The following test procedure applies to the Door Zone Stuck High Outside of Actual Door Zone.

- **Applicable Codes –** ASME A17.1 section 2.26.9.3.1
- **Schematic Location –** Door Zone Sensor input feeder – CT SRU board – (4.C,5.C); 24V (PWR) – MR SRU board – (5.C)
- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the Door Zone Stuck High Outside of Actual Door Zone.

Table 12: Door Zone Stuck High Outside of Actual Door Zone Test

Phase	Testing Procedure
Setup	**Software/ Hardware** - In Inspection mode, disconnect the DZ input from the sensor on the CT board. - Use a spare/unused wire from the Traveler cable to connect to the DZ input on the CT board. - Go to the machine room, take the same spare/unused Traveler wire, and connect it to an available M24 terminal.
Procedure	- Place the car in Automatic mode. - Position the car inside the Door Zone. - Place a Car Call or a Hall Call.
Expected Results	- The car should fault and come to a stop. - All Hall/Car Calls should be cleared.
Revert	**Hardware** - Disconnect +24V from DZ, then restore all wires to their original positions.

2.4.3 Door Zone Stuck High In-Flight

The following test procedure applies to the Door Zone Stuck High In-Flight.

- **Applicable Codes –** ASME A17.1 section 2.26.9.4
- **Schematic Location –** Door Zone Sensor input feeder – CT SRU board – (4.C,5.C); 24V (PWR) – MR SRU board – (5.C)

- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the Door Zone Stuck High In-Flight.

Table 13: Door Zone Stuck High In-Flight Test

Phase	Testing Procedure
Setup	**Software/ Hardware** - In Inspection mode, disconnect the DZ input from the sensor on the CT board. - Use a spare/unused wire from the Traveler cable to connect to the DZ input on the CT board. - Go to the machine room, take the same spare/unused Traveler wire, and **prepare** to connect it to an available M24 terminal.
Procedure	- Place the car in Automatic mode. - Place a Car Call or a Hall Call. - Jump DZ to +24V while the car is moving **and** is outside the Door Zone.
Expected Results	- The car should fault and come to a stop. - All Hall/Car Calls should be cleared.
Revert	**Hardware** - Disconnect +24V from DZ, then restore all wires to their original positions.

2.4.4 Door Zone Sensor

The following test procedure applies to the Door Zone Sensor.

- **Applicable Codes –** ASME A17.1 section 2.26.9.3.1
- **Schematic Location –** Door Zone Sensor input feeder – CT SRU board – (4.C,5.C); GND (REF) – CT SRU board – (2.D)
- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the Door Zone Sensor.

Table 14: Door Zone Sensor Test

Phase	Testing Procedure
Setup	**Software/ Hardware** - In Inspection mode, disconnect the DZ input from the sensor on the CT board. - Use a spare/unused wire from the Traveler cable to connect to the DZ input on the CT board. - Go to the machine room, take the same spare/unused Traveler wire, and **prepare** to connect it to the GND.
Procedure	- Place the car in Automatic mode. - Position the car inside the Door Zone. - Close the car and/or hall doors. - Connect the DZ to GND.
Expected Results	- The car should fault and come to a stop.

Revert	**Hardware** - Disconnect the DZ from GND, then restore all wires to their original positions.

2.5 SFP and SFM Relays During Preflight

The following test procedure applies to the SFP and SFM Relays During Preflight.

- **Applicable Codes –** ASME A17.1 section 2.26.9.4
- **Schematic Location –** SFM & SFP – MR SRU board – (5.G)
- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the SFP and SFM Relays During Preflight.

Table 15: SFP and SFM Relays During Preflight Test

Phase	Testing Procedure
Setup	**Software** - Place the car in Automatic mode.
Procedure	- Place Car Calls to floors X and Y, or place Hall Calls at floors X and Y. - Disconnect the SFM and/or SFP relays when the car stops at floor X **and** before it travels to floor Y.
Expected Results	- The car should fault and should not reattempt to move. - The Hall/Car Call should be cleared, and the system should not permit the car to move – test by issuing a call.
Revert	**Hardware** - Reconnect the SFM and/or SFP relays.

3 Electronic Protective Devices in Safe String

The sections below outline the test procedures related to Electronic Protective Devices (EPD) in Safety String.

3.1 Any Positively Broken Contact in the Safety String

The following test procedure applies to the Any Positively Broken Contact in the Safety String.

- **Applicable Codes –** ASME A17.1 section 2.26.2
- **Schematic Location –** Motor Contactors input feeder – MR SRU board – (7.F); Brake Contactors input feeder – MR SRU board – (7.F)
- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the Any Positively Broken Contact in the Safety String.

Table 16: Any Positively Broken Contact in the Safety String Test

Phase	Testing Procedure
Setup	- NA
Procedure	- While the car is running, activate the EPD.
Expected Results	- The Motor and Brake contactors should immediately open, and the car should come to a stop.
Revert	**Hardware** - Deactivate the EPD. If the car must be moved before deactivation, temporarily place a jumper across the EPD contact to bypass it. - Remove the jumper.

The table below lists the troubleshooting procedures for the Any Positively Broken Contact in the Safety String test.

Table 17: Any Positively Broken Contact in the Safety String Troubleshooting Procedures

Failure	Troubleshooting Procedure
The contactors failed to open	- Verify that the EPD is wired correctly. - Ensure there are no jumpers in the Safety String.
The car slid too far through the brake	- Adjust the machine brake to stop the car more quickly.

3.2 Contactor Feedback (Contactors Mounted Inside the Machine Room Enclosure)

The following test procedure applies to the Contactor Feedback (Contactors Mounted Inside the Machine Room Enclosure).

- **Applicable Codes –** ASME A17.1 section 2.26.2
- **Schematic Location –** M Contactor – Drive sheet – (1.F); B1 Contactor – Brake sheet – (1.H); B2 Contactor – Brake sheet – (5.H)

- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the Contactor Feedback (Contactors Mounted Inside the Machine Room Enclosure).

Table 18: Contactor Feedback (Contactors Mounted Inside the Machine Room Enclosure) Test

Phase	Testing Procedure
Setup	- NA
Procedure	- Press in the contactor being tested (M, B1, or B2).
Expected Results	- The controller should fault with a contactor feedback.
Revert	- NA

The table below lists the troubleshooting procedures for the Contactor Feedback (Contactors Mounted Inside the Machine Room Enclosure) test.

Table 19: Contactor Feedback (Contactors Mounted Inside the Machine Room Enclosure) Troubleshooting Procedures

Failure	Troubleshooting Procedure
The controller did not issue a fault	- Verify that the feedback signal is wired correctly. - Ensure there are no jumpers in place.

3.3 Contactor Feedback (Contactors Mounted Inside the Hoistway Enclosure)

The following test procedure applies to the Contactor Feedback (Contactors Mounted Inside the Hoistway Enclosure).

- **Applicable Codes –** ASME A17.1 section 2.26.2
- **Schematic Location –** B1CT – Drive sheet; MCT – MR Board Power sheet; B2CT – either on MR Board Power sheet or MR IO Connections sheet
- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the Contactor Feedback (Contactors Mounted Inside the Hoistway Enclosure).

Table 20: Contactor Feedback (Contactors Mounted Inside the Hoistway Enclosure) Test

Phase	Testing Procedure
Setup	- NA
Procedure	**M Contactor Test** - Jump 120VAC to terminal MCT. **B1 Contactor Test** - Jump 24VDC to terminal B1CT. **B2 Contactor Test** - Jump 120VAC to terminal B2CT.
Expected Results	- The controller should fault with a contactor feedback.

Revert	-	NA

The table below lists the troubleshooting procedures for the Contactor Feedback (Contactors Mounted Inside the Hoistway Enclosure) test.

Table 21: Contactor Feedback (Contactors Mounted Inside the Hoistway Enclosure) Troubleshooting Procedures

Failure	Troubleshooting Procedure
The controller did not issue a fault	- Verify that the feedback signal is wired correctly. - Ensure there are no jumpers in place.

3.4 Brake Board Feedback

The following test procedure applies to the Brake Board Feedback.

- **Applicable Codes –** ASME A17.1 sections 2.26.2 and 2.26.8.2
- **Schematic Location –** M24 – MR Power Supply section – (2.B); MM – MR SRU board – (6.F); B1 Contactor – Brake sheet – (1.H); B2 Contactor – Brake sheet – (5.H); Brake Coils – Brake sheet – (1-2.I); Emergency Brake Coils – Brake sheet – (5-6.I)
- **Testing Notes –** The brake control board serves as a redundant device to the brake contactor B1 and is provided to ensure compliance with ASME A17.1, clauses 2.26.8.2 and 2.26.9.3.1. It must be checked for failure before each start during automatic operation (see ASME A17.1, clause 2.26.9.4).

The table below outlines the step-by-step procedure for testing the Brake Board Feedback.

Table 22: Brake Board Feedback Test

Phase	Testing Procedure
Setup	**Software** - Clear any active alarms and faults, if present. **Hardware** - Place a jumper between M24 and MM on the MR board. - Ensure the Inspection/Normal switch is set to the NORMAL position.
Procedure	- Navigate to **Main Menu | Debug | Acceptance Test.** - Select **BRK BRD FEEDBACK**. - Select **Save**. - Press and hold the Enable and Up buttons to start the test. - When instructed, manually press and hold either the B1 or B2 contactor *(For systems with contactors mounted inside the hoistway enclosure, jump M24 to B1CT or 120 to B2CT.)* - Release the Enable and Up buttons. - The brake board applies voltage to the coil and confirms feedback. - Test results should be displayed on the screen.
Expected Results	- The software detects any difference between the command and the feedback.

	-	The screen shall display "Complete" if the voltage feedback is within 15% of the commanded value.
Revert	-	NA

The table below lists the troubleshooting procedures for the Brake Board Feedback test.

Table 23: Brake Board Feedback Troubleshooting Procedures

Failure	Troubleshooting Procedure
The test did not pass	- Verify that the B1 or B2 contactor toggled. - Ensure the brake coil is wired properly.

3.5 Motor Field Sensing

The following test procedure applies to the Motor Field Sensing.

- **Applicable Codes –** ASME A17.1 section 2.26.2.4
- **Schematic Location –** F1 and F2 (Drive: DSD412) – Drive and Regen section – (2-3.G)
- **Testing Notes –** This test is required only for DC applications.

The table below outlines the step-by-step procedure for testing the Motor Field Sensing.

Table 24: Motor Field Sensing Test

Phase	Testing Procedure
Setup	**Hardware** - Disconnect the main line power to the drive and controller. - Disconnect the field wires between the motor and drive (F1 and F2).
Procedure	- Reconnect the main line power to the drive and controller.
Expected Results	- After boot-up, the drive should display Error/Fault Code 905, and the controller should indicate a drive fault.
Revert	- Disconnect the main line power to the drive and controller. - Connect the field wires between the motor and drive (F1 and F2).

4 Emergency Brake

The sections below outline the test procedures related to Emergency Brake.

4.1 Unintended Car Movement Detection Means and Emergency Brake

The following test procedure applies to the Unintended Car Movement Detection Means and Emergency Brake.

- **Applicable Codes –** ASME A17.1 sections 2.19.2 and 2.19.3.1.2
- **Schematic Location –** DIP B8 – MR SRU board – (6.E); B1 Contactor – Brake sheet – (1.H); Emergency Brake Circuit – Brake section – (5-8.G-I)
- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the Unintended Car Movement Detection Means and Emergency Brake.

Table 25: Unintended Car Movement Detection Means and Emergency Brake Test

Phase	Testing Procedure
Setup	**Software** - Set parameter 01-0052 to ON. **Car** - Move the car to floor level. - Open the car and hall doors.
Procedure	- Set DIP B8 to ON. The emergency brake should automatically open. - Manually press in the B1 contactor. *(For systems with contactors mounted inside the hoistway enclosure, jump M24 to B1CT.)* · This will electrically lift the primary brake and cause the car to drift. The brake shall remain lifted as long as the B1 contactor is pressed. · The test should time out after 5 minutes.
Expected Results	- The onboard safety relays should drop, engaging the secondary brake. - The controller should log an Unintended Movement fault.
Revert	**Software** - Press and hold the EBRK Reset button. - Set parameter 01-0052 to OFF. **Hardware** - Set DIP B8 to the OFF.

The table below lists the troubleshooting procedures for the Unintended Car Movement Detection Means and Emergency Brake test.

Table 26: Unintended Car Movement Detection Means and Emergency Brake Troubleshooting Procedures

Failure	Troubleshooting Procedure
The emergency brake did not engage	- Ensure there are no jumpers in the emergency brake circuit. - Verify that the emergency brake sets when power is removed from the controller.
The car slid too far through the emergency brake	- Adjust the emergency brake to stop the car more quickly. - Confirm that 8" (or shorter) door zone magnets are being used.
The car did not drift due to high gear ratio	- Add more load to the car to help overcome gear friction. - Manually and safely turn the sheave assist in releasing the gears.

4.2 Door Zone Stuck High and Unintended Car Movement

The following test procedure applies to the Door Zone Stuck High and Unintended Car Movement.

- **Applicable Codes –** ASME A17.1 section 2.19.2.2(a)(1)(b)
- **Schematic Location –** Door Zone Sensor input feeder – CT SRU board – (4.C,5.C); DIP B8 – MR SRU board – (6.E); B1 Contactor – Brake section – (1.H); Emergency Brake Circuit – Brake section – (5-8.G-I); 24V (PWR) – CT SRU board – (2.D-E)
- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the Door Zone Stuck High and Unintended Car Movement.

Table 27: Door Zone Stuck High and Unintended Car Movement Test

Phase	Testing Procedure
Setup	**Software/ Hardware** - In Inspection mode, disconnect the DZ input from the sensor on the CT board. - Use a spare/unused wire from the Traveler cable to connect to the DZ input on the CT board. - Go to the machine room, take the same spare/unused Traveler wire, and connect it to an available M24 terminal. - Place the car in Automatic mode. - Set parameter 01-0052 to ON. **Car** - Move the car to floor level. - Open the car and hall doors.
Procedure	- Set DIP B8 to ON. The emergency brake should automatically open. - Manually press in the B1 contactor. *(For systems with contactors mounted inside the hoistway enclosure, jump M24 to B1CT.)* · This will electrically lift the primary brake and cause the car to drift. · The brake shall remain lifted as long as the B1 contactor is pressed. · The test should time out after 5 minutes.
Expected Results	- The onboard safety relays should drop, engaging the secondary brake.

	- The controller should log an Unintended Movement fault.
Revert	**Software** - Press and hold the EBRK Reset button. - Set parameter 01-0052 to OFF. **Hardware** - Set DIP B8 to the OFF. - Disconnect +24V from DZ, then restore all wires to their original positions.

The table below lists the troubleshooting procedures for the Door Zone Stuck High and Unintended Car Movement test.

Table 28: Door Zone Stuck High and Unintended Car Movement Troubleshooting Procedures

Failure	Troubleshooting Procedure
The emergency brake did not engage	- Ensure there are no jumpers in the emergency brake circuit. - Verify that the emergency brake sets when power is removed from the controller.
The car did not drift due to high gear ratio	- Add more load to the car to help overcome gear friction. - Manually and safely turn the sheave assist in releasing the gears.

4.3 Ascending Car Overspeed Detection Means and Emergency Brake

The following test procedure applies to the Ascending Car Overspeed Detection Means and Emergency Brake.

- **Applicable Codes –** ASME A17.1 sections 2.19.1 and 2.19.3.1.1
- **Schematic Location –** Governor Switch Contact input feeder – MR SRU board – (1.G); M24 – MR Power Supply section – (2.B); MM – MR SRU board – (6.F); B1 Contactor – Brake sheet – (1.H); B2 Contactor – Brake sheet – (5.H); Emergency Brake Circuit – Brake section – (5-8.G-I)
- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the Ascending Car Overspeed Detection Means and Emergency Brake.

Table 29: Ascending Car Overspeed Detection Means and Emergency Brake Test

Phase	Testing Procedure
Setup	**Software** - Clear any active alarms and faults, if present. - Navigate to **Main Menu | Setup | Speeds | Test A/D Speed**. - Set this value to match the speed at which the test is being conducted, in Feet Per Minute (FPM). **Hardware** - Place a jumper between M24 and MM on the MR board. - Ensure the Inspection/Normal switch is set to the NORMAL position.

	Drive ♦ KEB - In Basic Setup, set the Contract speed to match the Test speed. - In Speed Profile, set the High speed to match the Test speed. ♦ HPV900 S2 - In the A1 parameter, increase the Contract Motor speed based on the ratio of Test speed to Contract speed. · *Example: If the Contract speed is 500 FPM and the Test speed is 600 FPM (1.2×), and the Contract Motor speed is 1200 RPM, set the A1 value to 1440 RPM (1200 × 1.2).* ♦ M1000 - In the A1 parameter, adjust the Contract Motor speed using the same method as above. - In the A5 parameter, change the Max Motor speed to the overspeed value needed. - In the A5 parameter, increase the Max Frequency by the same percentage the Test speed exceeds the Contract speed. ♦ DSD - In Function 11, increase the Contract Motor speed to match the percentage increase in Test speed over Contract speed. · *Example: For a Contract speed of 500 FPM and a Test speed of 600 FPM (1.2×), and a Motor speed of 1200 RPM, set Function 11 to 1440 RPM.* **Car** - Position the car far enough below the top terminal landing to allow it to accelerate to Governor Trip speed and stop safely before reaching the final limit.
Procedure	- Navigate to **Main Menu | Debug | Acceptance Test.** - Select **ASC/DESC Overspeed.** - Select **Save.** - Press and hold the Enable and Up buttons. · The controller runs with a speed command reflecting the Test speed. - When the car is ascending, hold in the B1 contactor to keep the main brake lifted. *(For systems with contactors mounted inside the hoistway enclosure, jump M24 to B1CT.)* · Brakes automatically drop if the contactor is held in for more than 20 seconds. · If either the Enable, Up, or contactor is released before the test complete, the test shall be canceled immediately. The primary brake shall remain open as long as the contactor is pressed, and the Up and Enable inputs are active.
Expected Results	- The Governor switch should open. - The onboard safety relays should drop, engaging the secondary brake.
Revert	**Hardware** - Reset the Governor switch.

	- Press and hold the E-Brake Reset button on the MR board. - Disconnect the jumper between M24 and MM. **Drive** - Reset the drive parameters to the original values.

The table below lists the troubleshooting procedures for the Ascending Car Overspeed Detection Means and Emergency Brake test.

Table 30: Ascending Car Overspeed Detection Means and Emergency Brake Troubleshooting Procedures

Failure	Troubleshooting Procedure
The emergency brake did not engage	- Ensure the safety relays dropped. - Ensure there are no jumpers in the emergency brake circuit. - Verify that the emergency brake sets when power is removed from the controller.
The car slid too far through the emergency brake	- Adjust the emergency brake to stop the car more quickly. - Ensure the car is properly balanced.

4.4 Measuring Brake Slide Distance

The following test procedure applies to the Measuring Brake Slide Distance.

- **Applicable Codes –** NA
- **Schematic Location –** M24 – MR Power Supply section – (2.B); MM – MR SRU board – (6.F); B1 Contactor – Brake sheet – (1.H); B2 Contactor – Brake sheet – (5.H); Emergency Brake Circuit – Brake section – (5-8.G-I)
- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the Measuring Brake Slide Distance.

Table 31: Measuring Brake Slide Distance Test

Phase	Testing Procedure
Setup	**Software** - Clear any active alarms and faults, if present. **Hardware** - Place a jumper between M24 and MM on the MR board. - Ensure the Inspection/Normal switch is set to the NORMAL position.

Procedure	- Navigate to **Main Menu | Debug | Acceptance Test.**
	- Select **BRK SLIDE DIST** to test the main brake or **EBRK SLIDE DIST** to test the secondary brake**.**
	- Select **Save.**
	- Press the Enable and Down/Up buttons.
	  · If the Up button is selected, the car moves to the bottom landing.
	  · If the Down button is selected, the car moves to the top landing.
	- Press the Enable and Down/Up buttons again once the car is at Top/Bottom landing, respectively.

	· The controller moves the car toward the opposite landing. · Once the car reaches Contract speed, the controller should issue an ESTOP command. - Hold in either the B1 or B2 contactor to keep the corresponding brakes open. *(For systems with contactors mounted inside the hoistway enclosure, jump M24 to B1CT or 120 to B2CT.)* · Only one contactor can be held in during the test. · B1 is used to hold the main brake open, and B2 is used to hold the secondary brake open. - Brakes shall automatically drop if the contactors are held in for more than 10 seconds.
Expected Results	- Once the car has fully stopped, the UI shall display the slide distance. · The slide distance is also stored in parameter 16-0865 and 16-0866. To convert this value to inches, divide the value stored in the parameter by 50.8.
Revert	**Hardware** - Disconnect the jumper between M24 and MM.

The table below lists the troubleshooting procedures for the Measuring Brake Slide Distance test.

Table 32: Measuring Brake Slide Distance Troubleshooting Procedures

Failure	Troubleshooting Procedure
The emergency brake did not engage	- Ensure the safety relays dropped. - Ensure there are no jumpers in the emergency brake circuit. - Verify that the emergency brake sets when power is removed from the controller.
The car slid too far through the emergency brake	- Adjust the emergency brake to stop the car more quickly. - Ensure the car is properly balanced.

5 Inspection/Access Independent Speed Limiting

The following test procedure applies to the Inspection/Access Independent Speed Limiting.

- **Applicable Codes –** ASME A17.1 sections 2.12.7.3.3(b) and 2.26.1.4.1(d)(-1)
- **Schematic Location –** NA
- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the Inspection/Access Independent Speed Limiting.

Table 33: Inspection/Access Independent Speed Limiting Test

Phase	Testing Procedure
Setup	- NA
Procedure	- Navigate to **Main Menu | Setup | Speeds | Inspection**. - Set the Inspection speed to a value greater than 150 FPM.
Expected Results	- The controller shall display an Invalid Speed fault and prevent the car from running.
Revert	- Restore the Inspection speed to its original value.

6 Terminal and Emergency Stopping Devices

The sections below outline the test procedures related to Terminal and Emergency Stopping Devices.

6.1 Normal Terminal Stopping Device

The following test procedure applies to the Normal Terminal Stopping Device (NTSD).

- **Applicable Codes –** ASME A17.1 section 2.25.2
- **Schematic Location –** M24 – MR Power Supply section – (2.B); MM – MR SRU board – (6.F)
- **Testing Notes –** Emergency terminal stopping devices are bypassed during this test to indicate NTSD independence.

The table below outlines the step-by-step procedure for testing the NTSD.

Table 34: Normal Terminal Stopping Device Test

Phase	Testing Procedure
Setup	**Software** - Clear any active alarms and faults, if present. **Hardware** - Place a jumper between M24 and MM on the MR board. - Ensure the Inspection/Normal switch is set to the NORMAL position. **Car** - Position the car far enough away from the terminal landing being tested to allow a full-speed run.
Procedure	- Navigate to **Main Menu | Debug | Acceptance Test**. - Select **NTS**. - Select **Save**. · The UI should display “Checking if in DZ”. - Press the Enable and Up/Down buttons. · The controller should run the car at high speed in the selected direction toward the terminal landing.
Expected Results	♦ **Magnetek & L1000A** - When NTS is triggered, and depending on the aggressiveness of the Digital S-curve Technology ™ (U.S. Patent Pending), the MR board will display one of the following alarms: · In the up direction: NTS Up P1-1, NTS Up P1-2, NTS Up P1-3, NTS Up P1-4, NTS Up P1-5, NTS Up P1-6, NTS Up P1-7, NTS Up P1-8 · In the down direction: NTS Dn P1-1, NTS Dn P1-2, NTS Dn P1-3, NTS Dn P1-4, NTS Dn P1-5, NTS Dn P1-6, NTS Dn P1-7, NTS Dn P1-8 - The NTS output on the MR board should change state. - The car should slow down and come to a stop before reaching the final limit.

	♦ **KEB** - When NTS is triggered, and depending on the aggressiveness of the Digital S-curve Technology ™ (U.S. Patent Pending), the MR board will display one of the following alarms: · In the up direction: NTS Up P1-1, NTS Up P1-2, NTS Up P1-3, NTS Up P1-4, NTS Up P1-5, NTS Up P1-6, NTS Up P1-7, NTS Up P1-8 · In the down direction: NTS Dn P1-1, NTS Dn P1-2, NTS Dn P1-3, NTS Dn P1-4, NTS Dn P1-5, NTS Dn P1-6, NTS Dn P1-7, NTS Dn P1-8 - The NTS output on the MR board should change state. - The car should slow down and come to a stop before reaching the final limit. ♦ **DSD** - When NTS is triggered, and depending on the aggressiveness of the Digital S-curve Technology ™ (U.S. Patent Pending), the MR board will display one of the following alarms: · In the up direction: NTS Up P1-1, NTS Up P1-2, NTS Up P1-3, NTS Up P1-4, NTS Up P1-5, NTS Up P1-6, NTS Up P1-7, NTS Up P1-8 · In the down direction: NTS Dn P1-1, NTS Dn P1-2, NTS Dn P1-3, NTS Dn P1-4, NTS Dn P1-5, NTS Dn P1-6, NTS Dn P1-7, NTS Dn P1-8 - The NTS output on the MR board should change state. - The car should slow down and come to a stop before reaching the final limit.
Revert	**Hardware** - Disconnect the jumper between M24 and MM.

The table below lists the troubleshooting procedures for the NTSD test.

Table 35: Normal Terminal Stopping Device Troubleshooting Procedures

Failure	Troubleshooting Procedure
The car did not slow down at the switch	♦ **Magnetek & L1000A** - Ensure the drive NTS inputs are activating. ♦ **KEB** - Ensure the drive NTS inputs are activating. ♦ **DSD** - Ensure the drive NTS inputs are activating. - Arched Travel Disable (#111) must be =1 or ON.
The car slowed down but hit the final limit	♦ **Magnetek** - Change Parameter A4 | DECEL JERK IN 3. - Change Parameter A4 | DECEL JERK OUT 3. - Increase Parameter A4 | DECEL RATE 3. · The default value is 6 ft/s^2. Increasing it too much may result in loss of traction or cause the drive to fault with a DC OVERVOLT during a quick stop.

	♦ **L1000A** - Increase Parameter C1-09. · The default value is 6 ft/s^2. Increasing it too much may result in loss of traction or cause the drive to fault with a DC OVERVOLT during a quick stop. ♦ **KEB** - Increase Parameter LS33 to quicken the slowdown. · The default value is 6 ft/s^2. Increasing it too much may result in loss of traction or cause the drive to fault with a DC OVERVOLT during a quick stop. ♦ **DSD** - Adjust Ramp #3 Accel/Decel rates used during NTS.

6.2 Emergency Terminal Stopping Device

The following test procedure applies to the Emergency Terminal Stopping Device (ETSD).

- **Applicable Codes –** ASME A17.1 section 2.25.4.2
- **Schematic Location –** NTS Slowdown Signal input feeder – MR SRU board – (7.C); M24 – MR Power Supply section – (2.B); MM – MR SRU board – (6.F)
- **Testing Notes –** (1) This test must be performed once in the up and once in the down direction. (2) NTS switches are bypassed during this test to demonstrate independence. (3) Emergency terminal stopping devices are only required for speeds greater than 200 FPM. (4) This test is not required if ETSLD is used.

The table below outlines the step-by-step procedure for testing the ETSD.

Table 36: Emergency Terminal Stopping Device Test

Phase	Testing Procedure
Setup	**Software** - Clear any active alarms and faults, if present. **Hardware** - Place a jumper between M24 and MM on the MR board. - Ensure the Inspection/Normal switch is set to the NORMAL position. **Car** - Clear any existing faults. - Position the car far enough away from the terminal landing being tested to allow a full-speed run, but not as far as the opposite terminal landing.
Procedure	- Navigate to **Main Menu | Debug | Acceptance Test**. - Select **ETS**. - Select **Save**. · The UI should display “In Door Zone Check”. - Press and hold the Enable and Up/Down buttons.

	· The controller should run the car at high speed in the selected direction toward the terminal landing. · If the Enable or Direction button is released before the test completes, an emergency stop will occur, and the test will automatically fail.
Expected Results	- When the car passes the ETS Trip point being tested, the on-board safety relays should immediately drop. - Power to the driving machine motor and brake should be cut. - The car should come to a stop before reaching the buffer.
Revert	**Hardware / Software** - Disconnect the jumper between M24 and MM. - Manual Doors: If a lock fault is latched, return to normal operation to allow the car to automatically level at the floor.

The table below lists the troubleshooting procedures for the ETSD test.

Table 37: Emergency Terminal Stopping Device Troubleshooting Procedures

Failure	Troubleshooting Procedure
The car did not reach the full contract speed during the test	- Position the car at a landing farther from the terminal before starting the test.
The car/counterweight did not stop before reaching the buffer	- Increase the service brake tension. - Ensure the car is properly balanced.

6.3 Emergency Terminal Safety Limiting Device

The following test procedure applies to the Emergency Terminal Safety Limiting Device (ETSLD).

- **Applicable Codes –** ASME A17.1 section 2.25.4.1
- **Schematic Location –** NA
- **Testing Notes –** (1) This test is only required for Reduced Stroke Buffer applications. (2) This test can only be performed in the down direction. (3) NTS switches are bypassed during this test to demonstrate independence. (4) A modified version of the test may also be used (refer to **6.4** Alternative Test for Emergency Terminal Safety Limiting Device).

The table below outlines the step-by-step procedure for testing the ETSLD.

Table 38: Emergency Terminal Safety Limiting Device Test

Phase	Testing Procedure
Setup	**Hardware** - Place a jumper between M24 and MM on the MR board. - Ensure the Inspection/Normal switch is set to the NORMAL position. **Software** - Clear any active alarms and faults, if present.

	- The ETSL setup must be completed before running the test (refer to *C4 User Manual, Reduced Stroke Buffer*.) - The ETSL option must be enabled on the controller. - The Camera Offset must be set. - The Brake Slide Distance must be set. - The Buffer speed must be set. - The Buffer Distance must be set. **Drive** ♦ HPV900 S2 - In the A1 parameter, decrease the Contract speed to the Test speed. - Decrease the Contract Motor speed based on the ratio of the Test speed to Contract speed. · *Example: If the Contract speed is 1000 FPM and the Test speed is 800 FPM (0.8×), and the Contract Motor speed is 1200 RPM, set the A1 value to 960 RPM (1200 × 0.8).* ♦ M1000 - In the A1 parameter, decrease the Contract speed to the Test speed. - Adjust the Contract Motor speed using the same method as above. **Car** - Position the car at the top floor, within the door zone.
Procedure	- Navigate to **Main Menu | Debug | Acceptance Test**. - Select **ETSL**. - Select **Save**. · The UI should display “In Door Zone Check”. - Press and hold the Enable and Down buttons. · The controller should run the car at high speed in the down direction toward the bottom terminal landing. · If the Enable or Down button is released before the test completes, an emergency stop will occur, and the test will automatically fail. · Check the DETSL fault in the logged faults to view the position of the ETSL point.
Expected Results	- When the car passes the ETSL Trip point being tested, the on-board safety relays should immediately drop. - Power to the driving machine motor and brake should be cut. - The car should come to a stop somewhere in the middle of the hoistway.
Revert	**Hardware / Software** - Disconnect the jumper between M24 and MM. - Manual Doors: If a lock fault is latched, return to normal operation to allow the car to automatically level at the floor. **Drive** - Reset the drive parameters to the original values.

6.4 Alternative Test for Emergency Terminal Safety Limiting Device

The following test procedure applies to the Alternative Test for Emergency Terminal Safety Limiting Device.

1. Perform an ETSD test (refer to **6.2** Emergency Terminal Stopping Device) at the full rated car speed.

2. Perform a Car Buffer test (refer to **6.6** Car Buffer) at the Reduced Stroke Buffer speed:

   - Navigate to **Main Menu | Setup | Speeds | Test Buffer Speed**.
   - Set the value to the Reduced Stroke Buffer speed being used for the test.
   - The speed is entered in FPM.

6.5 Final Limits

The following test procedure applies to the Final Limits.

- **Applicable Codes –** ASME A17.1 section 2.25.3
- **Schematic Location –** Final Limits input feeder – MR SRU board – (1.G); H120 input feeder – MR SRU board – (1.H); M Contactor – Drive sheet – (1.F); B1 Contactor – Brake sheet – (1.H); B2 Contactor – Brake sheet – (5.H)
- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the Final Limits.

Table 39: Final Limits Test

Phase	Testing Procedure
Setup	**Car** - Position the car at a terminal landing. **Software** - Place the car in Inspection mode. - Navigate to **Main Menu | Setup | Miscellaneous | Bypass Term Limits**. - Set the Bypass Term Limits to ON. - Select **Save**.
Procedure	- Run the car into the Final Limit.
Expected Results	- When the car hits the final limit, contactors M and B should open. - Power to the driving machine motor and brake should be cut. - The car should come to a stop.
Revert	**Software** - Navigate to **Main Menu | Setup | Miscellaneous | Bypass Term Limits**. - Set the Bypass Term Limits to OFF. - Select **Save**. **Hardware/ Car / Software** - Place a jumper between BFL or TFL and H120. - Move the car away from the Final Limit. - Disconnect the jumper between BFL or TFL and H120. - Manual Doors: If a lock fault is latched, return to normal operation to allow the car to automatically level at the floor.

The table below lists the troubleshooting procedures for the Final Limits test.

Table 40: Final Limits Troubleshooting Procedures

Failure	Troubleshooting Procedure
The car did not stop at the Final Limit	- Verify that the Final Limit switch is wired to the fixed input. - Ensure there are no jumpers in the Safety String.

6.6 Car Buffer

The following test procedure applies to the Car Buffer.

- **Applicable Codes –** ASME A17.1 section 2.25.3
- **Schematic Location –** Buffer Switch input feeder – MR SRU board – (1.G); Final Limits input feeder – MR SRU board – (1.G); H120 input feeder – MR SRU board – (1.H); M24 – MR Power Supply section – (2.B); MM – MR SRU board – (6.F)
- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the Car Buffer.

Table 41: Car Buffer Test

Phase	Testing Procedure
Setup	**Hardware** - Place a jumper between M24 and MM on the MR board. - Ensure the Inspection/Normal switch is set to the NORMAL position. **Software** - Clear any active alarms and faults, if present. - Navigate to **Main Menu | Setup | Speeds | Test Buffer Speed**. - Set this value to match the speed at which the test is being conducted, in FPM. **Drive** ♦ <u>KEB</u> - In Basic Setup, set the Contract speed to match the Test speed. - In Speed Profile, set the High speed to match the Test speed. ♦ <u>Magnetek</u> - In the A1 parameter, increase the Contract Motor speed based on the ratio of Test speed to Contract speed. · *Example: If the Contract speed is 500 FPM and the Test speed is 600 FPM (1.2×), and the Contract Motor speed is 1200 RPM, set the A1 value to 1440 RPM (1200 × 1.2).* ♦ <u>M1000</u> - In the A1 parameter, adjust the Contract Motor speed using the same method as above. - In the A5 parameter, increase the Max Frequency by the same percentage the Test speed exceeds the Contract speed.

	♦ DSD - In Function 11, increase the Contract Motor speed to match the percentage increase in Test speed over Contract speed. · *Example: For a Contract speed of 500 FPM and a Test speed of 600 FPM (1.2×), and a Motor speed of 1200 RPM, set Function 11 to 1440 RPM.* **Car** - Position the car far enough away from the terminal landing being tested to allow a full-speed run.
Procedure	- Navigate to **Main Menu | Debug | Acceptance Test.** - Select **Car Buffer** (down direction test) or **Counter Buffer** (up direction test). - Select **Save.** · The UI should display "In Door Zone Check". - Press and hold the Enable and Up/Down buttons. · The controller should run the car in the selected direction at a speed command reflecting the Test speed. · If the Enable or Direction button is released before the test completes, an emergency stop will occur, and the test will automatically fail.
Expected Results	- The car should hit the buffer at the Test speed set.
Revert	**Hardware/ Software/ Car** - Disconnect the jumper between M24 and MM. - Bypass the Final Limit/Buffer Switch by placing a jumper between BFL or TFL and H120 and between BUF and H120. - In Inspection mode, take the car off the buffer. - Disconnect the jumper between BFL or TFL, BUF and H120. - Manual Doors: If a lock fault is latched, return to normal operation to allow the car to automatically level at the floor.

6.7 Car Safeties and Governor

The following test procedure applies to the Car Safeties and Governor.

- **Applicable Codes –** ASME A17.1 section 2.18
- **Schematic Location –** M24 – MR Power Supply section – (2.B); MM – MR SRU board – (6.F); M120 input feeder – MR SRU board – (1.H); GOV input feeder – MR SRU board – (1.G)
- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the Car Safeties and Governor.

Table 42: Car Safeties and Governor Test

Phase	Testing Procedure
Setup	**Software** - Clear any active alarms and faults, if present. - Navigate to **Main Menu | Setup | Speeds | Test A/D Speed**.

	- Set this value to match the speed at which the test is being conducted, in FPM. **Hardware** - Place a jumper between M24 and MM on the MR board. - Place a jumper between M120 and GOV on the MR board. - Ensure the Inspection/Normal switch is set to the NORMAL position. **Drive** ♦ KEB - In Basic Setup, set the Contract speed to match the Test speed. - In Speed Profile, set the High speed to match the Test speed. ♦ Magnetek - In the A1 parameter, increase the Contract Motor speed based on the ratio of Test speed to Contract speed. · *Example: If the Contract speed is 500 FPM and the Test speed is 600 FPM (1.2×), and the Contract Motor speed is 1200 RPM, set the A1 value to 1440 RPM (1200 × 1.2).* ♦ M1000 - In the A1 parameter, adjust the Contract Motor speed using the same method as above. - In the A5 parameter, change the Max Motor speed to the overspeed value needed. - In the A5 parameter, increase the Max Frequency by the same percentage the Test speed exceeds the Contract speed. **Car** - Position the car far enough away from the bottom terminal landing to allow a full-speed run.
Procedure	- Navigate to **Main Menu | Debug | Acceptance Test.** - Select **ASC/DESC Overspeed**. - Select **Save.** - Press and hold the Enable and Down buttons. · The controller should run the car in the down direction at a speed command reflecting the Test speed. · If the Enable or Down button is released before the test completes, an emergency stop will occur, and the test will automatically fail.
Expected Results	- The car should overspeed to the Governor Tripping speed. - The Governor will trip, activating the car safeties.
Revert	**Hardware / Software** - Disconnect the jumper between M24 and MM. - Disconnect the jumper between M120 and GOV. - Manual Doors: If a lock fault is latched, return to normal operation to allow the car to automatically level at the floor. - In Construction mode, move the car up to release the safeties then return the car to Normal mode. **Drive**

	- Reset the drive parameters to the original values.

The table below lists the troubleshooting procedures for the Car Safeties and Governor test.

Table 43: Car Safeties and Governor Troubleshooting Procedures

Failure	Troubleshooting Procedure
The governor did not trip	- Verify that the car reaches the Governor Trip speed. If it does not, increase the overspeed value in the drive.

6.8 Machine Roomless Car Safety (if Applicable)

The following test procedure applies to the Machine Roomless (MRL) Car Safety.

- **Applicable Codes –** ASME A17.1 section 2.18
- **Schematic Location –** C24 – CT SRU board – (2.B); Door Zone Sensor input feeder – CT SRU board – (4.C,5.C); SF3 input feeder – CT SRU board – (4.C); M24 – MR Power Supply section – (2.B); ML2 – Drive and Regen section – (8.E); M120 input feeder – MR SRU board – (1.H); GOV input feeder – MR SRU board – (1.G); BL contactor jumper – Drive and Regen section – (2.I)
- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the MRL Car Safety.

Table 44: Machine Roomless Car Safety Test

Phase	Testing Procedure
Setup	**Hardware / Software / Car** - Disconnect the power to the drive. - Ensure the Manual Pick and Manual Rescue inputs are programmed and connected. - Place the car in Inspection mode. - Position the car at the top floor. - Disconnect the DZ Sensor input. - Place a jumper between SF3 and C24. - Place a jumper between M24 and ML2. - Place a jumper between M120 and GOV on the MR board. - Disconnect the BL contactor jumper (L1 – L2 – L3). - Add car weights inside the cab.
Procedure	- Place the car in Construction Mode and close the hall doors. - Confirm that the Enable Construction Box is OFF to bypass software control. - Press and hold the Brake Release, MR Enable, and Up/Down buttons. · In case of an emergency, immediately release all three buttons (Brake Release, MR Enable, and Up/Down) to engage the brakes.
Expected Results	- The car should overspeed. - The MRL Car Safety should engage.
Revert	**Hardware / Software**

	- Reconnect the DZ Sensor input. - Reconnect the BL contactor jumper. - Disconnect the jumper between M120 and GOV. - Disconnect the jumper between M24 and ML2. - Disconnect the jumper between SF3 and C24. - Remove the car weights from inside the cab. - Move the car up to release the safeties then return the car to Normal mode. - Reconnect the power to the drive.

7 Redundancy

The sections below outline the test procedures related to Redundancy.

7.1 Safety Inputs

The following test procedure applies to the Safety Inputs.

- **Applicable Codes –** ASME A17.1 section 2.26.9.3.2
- **Schematic Location –** RDC Jumper – CT SRU board – (6.F), COP SRU boar – (6.F)
- **Testing Notes –** (1) Software/Hardware Electronic Protective Devices are monitored through redundant board inputs. (2) These inputs are continuously compared to ensure the proper functioning of the input circuitry. If a mismatch is detected, a Redundancy Fault is latched, and the car is taken out of service.

The table below lists the Electronic Protective Devices that are redundantly monitored by the Software/Hardware system.

Table 45: Electronic Protective Devices Monitored by the Software/Hardware System

Electronic Protective Device	Input Location
Machine Room Board	
Bottom Interlock	LFB/LRB
Middle Interlock(s)	LFM/LRM
Top Interlock	LFT/LRT
Machine Room Inspection Enable	Internal
Hoistway Access Top Up	ATU
Hoistway Access Top Down	ATD
Hoistway Access Bottom Up	ABU
Hoistway Access Bottom Down	ABD
Car Door Bypass	SWCAR
Hoistway Door Bypass	SWHO
Car Top Board	
Cartop Inspection Enable	507
Front Gate Switch	501
Rear Gate Switch	502
Car Operating Panel Board	
In-Car Stop Switch	SF2
Hoistway Access Enable	SFM

The table below outlines the step-by-step procedure for testing the Safety Inputs.

Table 46: Safety Inputs Test

Phase	Testing Procedure
Setup	**Hardware** - Locate RDC jumper.
Procedure	- Remove RDC jumper.

Expected Results	- The controller should latch a Redundancy fault and take the car out of service.
Revert	**Hardware** - Restore the RDC jumper.

The table below lists the troubleshooting procedures for the Safety Inputs test.

Table 47: Safety Inputs Troubleshooting Procedures

Failure	Troubleshooting Procedure
The car did not detect a Redundancy fault	- Contact Smartrise

7.2 Removal of Power

The sections below outline the Removal of Power test procedures.

7.2.1 Machine Brake Power

The following test procedure applies to the Machine Brake Power.

- **Applicable Codes –** ASME A17.1 section 2.26.8.2
- **Schematic Location –** B1 Contactor – Brake sheet – (1.H)
- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the Machine Brake Power.

Table 48: Machine Brake Power Test

Phase	Testing Procedure
Setup	- NA
Procedure	- While the car is running, hold the B1 contactor in the closed position with an insulated tool. *(For systems with contactors mounted inside the hoistway enclosure, jump M24 to B1CT.)*
Expected Results	- At the end of the run, the machine brake should drop. - The controller should issue a B Contactor fault.
Revert	**Hardware** - Release the B contactor

7.2.2 Motor Power

The following test procedure applies to the Motor Power.

- **Applicable Codes –** ASME A17.1 section 2.26.9.5.1
- **Schematic Location –** M Contactor – Drive sheet – (1.F)

- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the Motor Power.

Table 49: Motor Power Test

Phase	Testing Procedure
Setup	- NA
Procedure	- While the car is running, hold the M contactor in the closed position with an insulated tool. *(For systems with contactors mounted inside the hoistway enclosure, jump 120 to MCT.)*
Expected Results	- At the end of the run, the drive relay should open. - Power should be removed from the motor. - The controller should issue an M Contactor fault.
Revert	**Hardware** - Release the M contactor.

8 Ground Faults

The sections below outline the test procedures related to Ground Faults.

8.1 EPD Input to REF

The following test procedure applies to the EPD Input to REF (M24 to REF).

- **Applicable Codes –** ASME A17.1 section 2.26.9.3
- **Schematic Location –** M24 – MR Power Supply section – (2.B); REF – MR Power Supply section – (2.C)
- **Testing Notes –** This test requires intentionally shorting M24 to REF.

The table below outlines the step-by-step procedure for testing the EPD Input to REF.

Table 50: EPD Input to REF Test

Phase	Testing Procedure
Setup	- NA
Procedure	- Place a jumper between M24 and REF.
Expected Results	- Power should be removed from the M24 Bus. - M24 to REF DC voltage should read 0 VDC.
Revert	**Hardware** - Disconnect the jumper between M24 and REF. - Reset the M24 breaker.

8.2 Safety String to Ground

The following test procedure applies to the Safety String to Ground.

- **Applicable Codes –** ASME A17.1 section 2.26.9.3
- **Schematic Location –** 120V – MR SRU board – (7.G)
- **Testing Notes –** This test requires intentionally shorting a 120VAC Bus to REF.

The table below outlines the step-by-step procedure for testing the Safety String to Ground.

Table 51: Safety String to Ground Test

Phase	Testing Procedure
Setup	**Hardware** - Ensure all Safety String contacts are closed.
Procedure	- Place a jumper from 120 to Ground.
Expected Results	- Either the onboard fuse will open while the short is present or the breaker will open.
Revert	**Hardware** - Disconnect the jumper from 120 to Ground. - Reset the circuit breaker or power cycle the MR board.

9 Emergency Operation

The sections below outline the test procedures related to Emergency Operation.

9.1 Firefighter Emergency Operation

The sections below outline the Firefighter Emergency Operation (FEO) test procedures.

9.1.1 Firefighter Emergency Operation Interruption of Power

The following test procedure applies to the FEO Interruption of Power.

- **Applicable Codes –** ASME A17.1 section 2.27.3.4
- **Schematic Location –** NA
- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the FEO Interruption of Power.

Table 52: Firefighter Emergency Operation Interruption of Power Test

Phase	Testing Procedure
Setup	- NA
Procedure	- Recall the car using Phase I, the run it car using Phase II operation to verify functionality. - Reset the main line power.
Expected Results	- The car should remain in FEO with the correct phase and position.
Revert	**Hardware** - Reset FEO using lobby key switch.

9.1.2 Firefighter Emergency Operation Phase I and Load Weighing Device

The following test procedure applies to the FEO Phase I and Load Weighing Device (LWD).

- **Applicable Codes –** ASME A17.1 section 2.27.3.1.6(m)
- **Schematic Location –** Full Load input feeder – CT SRU board or MR SRU board – one of the inputs; 24V (PWR) – CT SRU board – (2.D) or MR SRU board – (2.B)
- **Testing Notes –** NA

Load Weighing Device Considerations:

Smartrise controllers support two types of LWD:

- **Discrete Load Weighing Device –** Refer directly to the table below for testing instructions.

- **Serial Load Weighing Device –** Assign the Full Load Input (under Safety) to an unused input, with the recommendation of selecting an unused input on the MR board, by navigating to **Main Menu | Setup | Setup I/O**. Then, proceed to the table below for testing instructions.

The table below outlines the step-by-step procedure for testing the FEO Phase I and LWD.

Table 53: Firefighter Emergency Operation Phase I and Load Weighing Device Test

Phase	Testing Procedure
Setup	**Car** - Position the car far enough away from the Main Recall landing. **Hardware** - Place a jumper between the Full Load input and +24V.
Procedure	- Place the car in FEO Phase I.
Expected Results	- Verify that the car recalls to the Main Recall landing.
Revert	**Hardware** - Disconnect the jumper between the Full Load input and +24V. - Reset FEO using lobby key switch.

9.1.3 Firefighter Emergency Operation Phase II and Load Weighing Device

The following test procedure applies to the FEO Phase II and LWD.

- **Applicable Codes –** ASME A17.1 section 2.27.3.3.1(l)
- **Schematic Location –** Full Load input feeder – CT SRU board or MR SRU board – one of the inputs; 24V (PWR) – CT SRU board – (2.D) or MR SRU board – (2.B)
- **Testing Notes –** NA

Load Weighing Device Considerations:

Smartrise controllers support two types of LWD:

- **Discrete Load Weighing Device –** Refer directly to the table below for testing instructions.
- **Serial Load Weighing Device –** Assign the Full Load Input (under Safety) to an unused input, with the recommendation of selecting an unused input on the COP board, by navigating to **Main Menu | Setup | Setup I/O**. Then, proceed to the table below for testing instructions.

The table below outlines the step-by-step procedure for testing the FEO Phase II and LWD.

Table 54: Firefighter Emergency Operation PhaseI I and Load Weighing Device Test

Phase	Testing Procedure
Setup	**Software** - Set the Main Recall landing to a floor above the bottom terminal floor via **Main Menu	Setup	Fire	Main Recall	Floor**. - Place the car in FEO Phase II.

	Hardware - Place a jumper between the Full Load input and +24V.
Procedure	- Enter a Car Call below the current floor.
Expected Results	- Verify that the car responds to the Car Call.
Revert	**Hardware** - Disconnect the jumper between the Full Load input and +24V. - Reset FEO using lobby key switch.

9.1.4 Hoistway Landing Slide Power to REF

The following test procedure applies to the Hoistway Landing Slide Power to REF (H24 to REF).

- **Applicable Codes –** ASME A17.1 section 2.27.3.3.6
- **Schematic Location –** H24 – MR Power Supply section – (4.B); REF – MR Power Supply section – (2.C)
- **Testing Notes –** This test requires intentionally shorting H24 to REF.

The table below outlines the step-by-step procedure for testing the Hoistway Landing Slide Power to REF.

Table 55: Hoistway Landing Slide Power to REF Test

Phase	Testing Procedure
Setup	**Software** - Place the car in FEO Phase II.
Procedure	- Place a jumper from H24 to REF.
Expected Results	- Power should be removed from the H24 Bus. - H24 to REF DC voltage should read 0 VDC. - The car should continue to operate on FEO Phase II.
Revert	**Hardware** - Disconnect the jumper from H24 to REF. - Reset the H24 breaker.

9.2 Emergency Power

The sections below outline the Emergency Power test procedures.

9.2.1 One Elevator at a Time on Emergency Power

The following test procedure applies to the One Elevator at a Time on Emergency Power.

- **Applicable Codes –** ASME A17.1 section 2.27.2
- **Schematic Location –** Select Car X – Riser Board (RB2)
- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the One Elevator at a Time on Emergency Power.

Table 56: One Elevator at a Time on Emergency Power Test

Phase	Testing Procedure
Setup	**Hardware** - Set the Emergency Power Selector switch to the AUTOMATIC position.
Procedure	- Start the emergency generator.
Expected Results	- Cars should proceed to the designated level one at a time, based on availability. - The car with the lowest index number should be placed into service. - Adjusting the selector switch should take the current selected car out of service at the next available floor and place the newly selected car into service.
Revert	- Restore normal building power.

9.2.2 All Elevators at the Same Time on Emergency Power

The following test procedure applies to the All Elevators at the Same Time on Emergency Power.

- **Applicable Codes –** ASME A17.1 section 2.27.2
- **Schematic Location –** NA
- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the All Elevators at the Same Time on Emergency Power.

Table 57: All Elevators at the Same Time on Emergency Power Test

Phase	Testing Procedure
Setup	- NA
Procedure	- Start the emergency generator.
Expected Results	- All cars should operate normally, and the Emergency Power Operation lamp should illuminate.
Revert	- Restore normal building power.

10 Traction Loss

The following test procedure applies to the Traction Loss.

- **Applicable Codes –** ASME A17.1 section 2.20.8.1
- **Schematic Location –** DIP A3 – MR SRU board – (6.D)
- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the Traction Loss.

Table 58: Traction Loss Test

Phase	Testing Procedure
Setup	**Software** - Place the car in Normal mode. **Car** - Position the car at the bottom floor.
Procedure	- Set DIP A3 to ON to disable the car doors. - Set parameter 01-0154 to ON to disable the drive feedback. · When this parameter is set, the speed from the position encoder is replaced by zero. · If the car travels faster than Traction Loss Threshold, a Traction Loss fault will be triggered regardless of the Traction Loss Offset Percentage setting. - Navigate to **Main Menu | Setup | Safety | Traction Loss** and configure the parameters as needed: - **Threshold:** Sets the minimum car speed required to trigger a Traction Loss fault. · If the car is traveling below this speed, Traction Loss is not detected. - **Timeout:** Sets the duration that Traction Loss must be detected before a fault is set. · A fault will occur if Traction Loss persists longer than this time. - **Offset:** Sets the percentage difference between the Encoder speed and the car speed needed to trigger a Traction Loss fault. The maximum offset value is 60%. · A traction loss fault will occur if the difference meets or exceeds the set percentage. - Enter a Car Call to a landing that causes the car speed to exceed the Traction Loss Threshold.
Expected Results	- The car should fault before reaching the destination. - The controller should latch a Traction Loss fault, and the car should not resume operation.
Revert	**Software** - Set parameter 01-0154 to OFF. **Hardware** - Press and hold the TLOSS Reset button.

	· The TLOSS Reset button will be disabled if the Traction Loss Reset input is programmed on the controller. To reset the Traction Loss fault, the input must be in a low state. - To re-enable car doors (if desired), set DIP A3 to OFF.

The table below lists the troubleshooting procedures for the Traction Loss test.

Table 59: Traction Loss Troubleshooting Procedures

Failure	Troubleshooting Procedure
The car did not issue a Traction Loss fault	**Option I:** - Verify the Traction Loss Trip Threshold and Offset settings in the Traction Loss Safety menu. - Ensure the settings are adjusted according to job-specific requirements before running the test. **Option II:** - Increase the travel distance by entering a Car Call to a more distant floor to exceed the configured threshold.

11 Manual Rescue

The following test procedure applies to the Manual Rescue.

- **Applicable Codes –** ASME A17.1 section 2.27.2
- **Schematic Location –** B1 Contactor – Brake sheet – (1.H); M24 – MR Power Supply section – (2.B); ML2 – Drive and Regen section – (8.E)
- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the Manual Rescue.

Table 60: Manual Rescue Test

Phase	Testing Procedure
Setup	**Hardware / Software / Car** - Place a jumper between M24 and ML2. - Place the car in Inspection mode and position the car between two floors.
Procedure	- Turn OFF power to the controller. - Set the Inspection/Normal switch to the NORMAL position. - From the Emergency Rescue Device, turn ON the Battery Disconnect switch. - Place the car in Construction Mode and close the hall doors. - Confirm that the Enable Construction Box is OFF to bypass software control. - Press and hold the Brake Release, MR Enable, and Up buttons. - Manually open the Front or Rear doors.
Expected Results	- The Hold Voltage should be equal to the Relevel Voltage. - The B1 contactor should pick, the brakes should lift, and the car should drift to the nearest floor. - Once at the landing, the car should go out of service with its doors opened.
Revert	**Hardware** - Disconnect the jumper between M24 and ML2.

12 Direction Counter Trip Reset

The following test procedure applies to the Direction Counter Trip Reset.

- **Applicable Codes –** NA
- **Schematic Location –** NA
- **Testing Notes –** NA

The table below outlines the step-by-step procedure for testing the Direction Counter Trip Reset.

Table 61: Direction Counter Trip Reset Test

Phase	Testing Procedure
Setup	- NA
Procedure	**View the Current Value of the Direction Change Counter:** - Navigate to **Main Menu | Debug | View Debug Data**. - Select option 030, which displays the Direction Change Counter. **Perform the Test:** - Navigate to **Main Menu | Setup | Miscellaneous | Dir. Counter Limit**. - Enter the Access Code (provided by Technical Support). - Set the Direction Counter Limit to 10 increments above the current counter value. - Move the car in various directions, changing direction 10 times, while monitoring the counter. · The Direction Change Counter increments with every change in direction.
Expected Results	- The car should go out of service after the 10th direction change. · Once the direction counter exceeds the limit, it cannot be reset.
Revert	- Set a new threshold for the number of direction changes.

13 Testing Under Excess Load with a Load Weighing Device Present

When conducting the controller-related tests specified in A17.1 Section 2.16.8, which address system behavior with an additional load of up to 25% above the rated load, a Load Weighing Device may be present. If installed, the Load Weighing Device must be bypassed before testing. Follow the appropriate steps based on the type of Load Weighing Device:

- **Discrete Load Weighing Device:** Disconnect the Full Load and Overload inputs. These can be found on either the MR or CT board.

  Important: Reconnect these inputs after testing is complete.

- **Serial Load Weighing Device:**

  1. Navigate to **Main Menu | Setup | Load Weigher | Debug**.
  2. set **Debug** to **ON**.
  3. Scroll right and press **Save**.

  Important: After testing, revert the by setting **Debug** to **OFF**.

Once the Load Weighing Device has been bypassed, the tests specified in A17.1 Section 2.16.8 can be conducted. The system should safely lower, stop, and hold the car with an additional load of up to 25% beyond the rated load.