

TAC32T

Inspector's Guide

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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.

Introduction

This guide has been developed as an aid for the inspector or other 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.

Procedure Reference Material

The following procedures are provided for the inspection of the TAC32 Traction System and do not differ significantly from the industry inspection guides for traction elevator systems, including MRL and SIL rated E/E/PE systems. The TAC32T System is conventional as far as traction elevator systems are concerned, and inspection procedures used on TAC32T are no different than those used for other systems. For procedures not in this guide, please refer to the appropriate ASME documentation.

Access and Egress Procedures

The access and egress procedures that are used to enter 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:

- Locate the position and counterweights of the car being accessed, as well as any other cars/counterweights in the vicinity. Take appropriate measure to avoid hazards.
- Before beginning work, check the car top for oil or grease, and clean as required.

Access and Egress Procedures*(continued)*

DO NOT attached electrical cords on the car or counterweight ropes.

- 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.



DO NOT hold onto the counterweight ropes while the car is moving.



DO NOT stand on the car top emergency access cover, it may not be able to hold total body weight.

- 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.



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

Access and Egress Procedures*(continued)***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

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

- Locate the position and counterweights of the car being accessed, as well as any other cars/counterweights in the vicinity.
- Obtain control of the car.
- Identify a refuge space.
- 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 a 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 (e. g., pump, motors, belts, and sheaves), and ensure that clothing and hands can not get caught in them.
- Avoid smoking, or the use of open flames in the pit.

Preliminary Information

Before all tests, verify the following:

- All weight is removed from the car.
- All temporary jumpers are removed from the controller.
- All safeties preventing proper operation are removed.
- The controller is on Door Disconnect (Position DOOR switch located on IOE Card to DISC).
- The car is on Normal Operation.

Note: A TST Command will abort any TST test.

Accessing the Inspector Tests on the UIT

All of the tests in this manual can be run through the User Interface Tool (UIT). The UIT is located on the CPUA Card and consists of a two line text display and four buttons. To access the menu of test commands, start by pressing the ENTER button once. The screen should display:

ThyssenKrupp
Elevator

Press the ENTER button again, and the UIT will prompt for a pin #:

Enter PIN #

Enter the PIN number provided. If you do not have the PIN number or are unable to navigate to this screen, contact your service provider.

Once the PIN number has been correctly entered, the block select menu will be active. Using the UP key, navigate to the Inspector Tests:

BLOCK SELECT
INSPECTOR TESTS

Press ENTER to access the inspector tests menu. Use UP/DOWN to navigate through the different commands. Press ENTER to run the command being displayed. See the Inspector Tests Menu on page 7.

Inspector Tests Menu

FLT-SHOW FAULTS?*

RFL-CLEAR FLT?

TFR-RESET FLT?

SCCB-BOT CALL?

SCC2-FLR 2 CALL?

SCC(TOP-1)-FLR (TOP-1) CALL?*

SCCT – TOP CALL?

TST-CANCEL TEST?

TST1-NTSD TEST?

TST2-ETX TEST?

TST3-BUFFER TST?

TST4-OVRSPD TST?

TST5-UIM TEST?

TST6-TST5 W/ OD?

TST7-OVRSPD TST?

TST9-FTSD TEST?

TST10-LOAD TEST?

ENCODER TEST?

LEVELING TEST?

SBM-TRACTION TST?

*Only appears when faults are present.

** Car call to one floor below top,
only appears with more than 3 floors.

UIT Inspector Tests Variable Selection

The commands TST3, TST4, and TST7 require the input of additional variables, such as strike speed, overspeed, and acceleration. This function is achieved by a special functionality of the buttons. For example, TST3 requires strike speed as an argument. Once TST3 is selected in the inspector tests menu, a screen appears that looks like this:

STRIKE SPEED:
700 FPM?

To return to the previous screen, press the ESC key. The UP and DOWN keys change the value. The DOWN key changes the value in the tenths place between 0 and 9. So pressing the DOWN key will increase the value to 710 in our example. Pressing the DOWN key again increases the value to 720. If the current value is 790, pressing the DOWN button will change the value back to 700. The up key works the same way except for changing the hundredths position. The value can go above 10 but is capped (and will rollover) based on the variable being selected. To select the value currently present on the screen – in this case 700 FPM, press the ENTER key.

Final Limit Recovery

To remove the car from the final limit:

1. Place the car on Inspection Operation.
2. Install a temporary jumper from CON60:6 (P24) to CON60:3 (FTSD) on the IOE Card.
3. Run the car UP if on the bottom final limit, or DOWN if on the top final limit.
4. Remove the temporary jumper installed previously.
5. Return the car to Normal Operation.

Note: The car will only be permitted to run on Inspection Operation with the jumper in place.

Governor Switch Recovery

Resetting the governor switch is determined by the type of elevator being inspected.

For MRL elevators: Perform a Governor Switch Reset (GSR).

For conventional elevators:

- Install a temporary jumper from CON13:1 (MR1) to CON13:2 (MR2) on the FWIA Card.
- Manually reset the governor switch.
- Remove the temporary jumper.

Monitor the status of the Safety String via the LED labeled "SAFMR" on the IOE Card.

Safety String Description

The Safety String is a combination of inputs that engages the safety device of the car. This includes, but is not limited to SAFCR, CST, SAFGR, FTSD, SAFCAR, SAFMR, SAFHW, SAFPLD, SAFSP, NOPROG, and SAF3. If any of these activate, the Safety String opens – preventing movement of the car.

125% Rated Load Test

Note: The drive is not required to lift 125% load.

1. Make multiple trips to transfer 125% of the rated load to the second landing of the building, or a landing located above the second landing.
2. Place 125% of the rated load in the cab at the second or higher floor.
3. Enter a bottom landing terminal car call, SCCB Command.
4. Verify that the control system will lower 125% of the rated load and hold it properly.

**TST1
NTSD Test
Bottom Terminal**

1. Place 125% of the rated load into the cab.
2. With the car at the top landing, issue a TST1 Command. The UIT will display:

**TST1-NTSD TEST?
NTSD ARMED**

3. Enter a bottom terminal landing car call, SCCB Command.
4. Verify the following:
 - The car slows down with the NTSD System.Example UIT display:

**DMD:150 SPD:055
NTSD CLAMP: ON**

Observe: The NTSD CLAMP turns on and the car demand speed (DMD) locks at contract speed.

- The bottom normal limit is reached and the car levels to the bottom floor.

Example UIT display:

**CAR LEVEL
DLB VEL: -9 FPM**

Top Terminal

1. With the empty car at the bottom landing, issue a TST1 Command. The UIT will display:

**TST1-NTSD TEST?
NTSD ARMED**

2. Enter a top terminal landing car call, SCCT Command.
3. Verify the following:
 - The car slows down with the NTSD System.Example UIT display:

**DMD:150 SPD:055
NTSD CLAMP: ON**

Observe: The NTSD CLAMP turns on and the car demand speed (DMD) locks at contract speed.

- The top normal limit is reached and car levels to top floor.

Example UIT display:

**CAR LEVEL
DLT VEL: 9 FPM**

TST2 ETSx Test

Note: The car may strike the car buffer during the testing of the ETSx System, which is allowable as long as the car speed is at or below the buffer nameplate striking speed.

Before the Test

If the counterweight safeties have been provided, inhibit the movable jaw of the counterweight governor from engaging and preventing the counterweight safety arm from operating. This action prevents setting off the counterweight safety as it bounces when the car strikes the buffer.

Bottom Terminal

1. Place 100% of the rated load into the cab.
2. With the car at the top landing, issue a TST2 Command.
The UIT will display:

TST2-ETsx TEST? ETSD ARMED

3. Enter a bottom terminal landing car call, SCCB Command.
4. Verify that the ETSx System has opened the safety circuit via SAFSP.
Example UIT display:

FTSD=OFF 699 FPM SAFSP=1 699 FPM

Note: If FTSD changes to ON, or SAFSP changes to 0, the speed to the right will freeze at the speed which it changed.

Observe: SAFSP opens the safety circuit; if final limit is reached, the speed is lower than nameplate striking speed.

5. Issue a TFR Command to reset faults.

- Notes:**
- The car will level into the nearest landing.
 - See Final Limit Recovery on page 8.

TST2
ETSx Test
*(continued)***Top Terminal**

1. With the car at the bottom landing, issue a TST2 Command.
The UIT will display:

TST2-ETSX TEST? ETSD ARMED

2. Enter a top terminal landing car call, SCCT Command.
3. Verify the ETSx System has opened safety circuit via SAFSP.
Example UIT display:

FTSD=OFF 699 FPM SAFSP=1 699 FPM

Note: If FTSD changes to ON or SAFSP changes to 0, the speed to the right will freeze at the speed which it changed.

Observe: SAFSP opens the safety circuit; if final limit is reached, the speed is lower than nameplate striking speed.

4. Issue a TFR Command to reset faults.

- Notes:**
- The car will level into the nearest landing.
 - See Final Limit Recovery on page 8.

TST3

Car Buffer Test
Counterweight Buffer Test

When the Buffer Test is enabled, the ETSD System, the NTSD System, and the normal limits are disabled. The car is also prevented from decelerating once it reaches the programmed buffer strike speed for the given run. After completion of the test, the system automatically returns to normal mode with all safety backup systems enabled.



The final limit **MUST NOT** be jumped out during the run into the buffer. If a full stroke of the buffer cannot be achieved, temporarily relocate the final limit switch in order to achieve full compression of the respected buffer, and then return the switch to its original location after the test.

Before proceeding, verify the following:

- All adjacent cars in the hoistway are positioned at the top terminal floor and taken out of service.
- The top and inside of the car under test has been inspected, and all loose objects have been removed.
- All rope guards are installed.
- The buffers are filled with oil.

Notes:

- If the counterweight safeties have been provided, inhibit the movable jaw of the counterweight governor from engaging and preventing the counterweight safety arm from operating. This action prevents setting of the counterweight safety as it bounces when the car strikes the buffer.
- For reduced stroke buffers, set the buffer strike speed to the appropriate rated car strike speed. See the following table. For modernization jobs, see the buffer nameplate.



Striking the reduced stroke buffers at full contract speed will cause damage to the car.

Buffer Nameplate	Rated Car Strike Speed
200	200
288	250
402	350
460	400
575	500
805	700
920	800
1150	1000

Post Buffer Test

1. See Final Limit Recovery on page 8.
2. Place the car on Inspection Operation.
3. Verify that the buffer is fully compressed.
4. Inspect car, counterweight, and buffer for possible damage.
5. Install a temporary jumper from CON10:8 (AC1B) to CON11:2 (HW2) on the FWIA Card to bypass the hoistway safety devices.
6. Run the car away from the buffer.

Car Buffer Test

1. Place 100% of the rated load into the cab.
2. With the car two or more floors above the bottom terminal, issue a TST3 Command. The UIT will prompt for buffer strike speed. Once entered, the UIT will display:

TST3-BUFFER TST? ARMED: XXX FPM
--

3. Enter a bottom terminal landing car call, SCCB Command.
4. Verify that the car strikes the buffer at the correct speed.
Example UIT display:

FTSD=OFF 699 FPM SS=1 699 FPM

Observe: Line 1 displays the car speed at final limit. Line 2 displays the car speed at Safety String opening. See Safety String Description.

5. Issue a TFR Command.
6. Perform Post Buffer Test for TST3.

Counterweight Buffer Test

1. With the car at the bottom terminal, issue a TST3 Command. The UIT will prompt for buffer strike speed. Once entered, the UIT will display:

TST3-BUFFER TST? ARMED: XXX FPM
--

2. Enter a top terminal landing car call, SCCT Command.

TST3*(continued)*

3. Verify that the counterweight strikes the buffer at the correct speed.

Example UIT display:

FTSD=OFF	699 FPM
SS=1	699 FPM

Observe: Line 1 displays the car speed at final limit. Line 2 displays the cat speed at Safety String opening. See Safety String Description.

4. Issue a TFR Command.
5. Perform Post Buffer Test for TST3.

TST4**Governor Overspeed Test****Safety Tests****Car Safety Test****Counterweight Safety Test**

When the Overspeed/Safety Test is enabled, the ETSD System and the overspeed protection are disabled. The car will NOT be prevented from decelerating. If the governor switch does not activate, the car will stop normally at the call floor. After completion of the test, the system automatically returns to normal mode with all safety backup systems enabled.

Note: To overspeed during TST4, press and hold UDL. Release UDL to reduce the speed back to contract speed.

**Governor
Overspeed Test**

1. With the car at the bottom landing, issue a TST4 Command. The UIT will prompt for overspeed and acceleration rates. Enter the following settings:
 - Overspeed = Governor overspeed switch trip speed + 10 fpm.
 - Accel = Desired acceleration from contract speed to trip speed. The overspeed acceleration rate must be less than or equal to the programmed acceleration value (M39).

Once entered, the UIT will display:

TST4-OVRSPD TST?
ARMED-REG CALL

2. Enter a top terminal landing car call, SCCT Command.

Governor Overspeed Test*(continued)*

3. After the car reaches top speed, increase the car speed by pressing and holding UDL on the CUPA Card.
4. Verify that the governor switch trips at the proper speed.

Example UIT display before governor switch trip:

SS=1 699 FPM CAR SPD: 0699

Example UIT display after governor switch trip:

SS=0 797 FPM CAR MOVED 142 IN

Observe: The speed on line one will freeze as the Safety String opens (SS=0). The distance noted on line 2 is the distance the car travels after the Safety String opened.

5. Place the car on Inspection Operation.
6. Reset the governor electrical switch. See Governor Switch Recovery.
7. Issue a TFR Command.

Safety Tests

Before proceeding, verify the following:

- The safety and the governor are free of debris, and the rails are clean.
- All adjacent cars in the hoistway are positioned at the top terminal floor and taken out of service.
- The top and inside of the car under test has been inspected, and all loose objects have been removed.
- All rope guards are installed.

Car Safety Test

1. If the counterweight safeties have been provided, inhibit the movable jaw of the counterweight governor from engaging and preventing the counterweight safety arm from operating.
2. Place 100% of rated load into the cab.

Notes:

- Do NOT jumper the car safety plank switch. The safety plank switch MUST be active.
- See governor nameplate to determine the car speed at which the safety jaws should set.
- 3. Install a temporary jumper from CON13:1 (MR1) to CON13:2 (MR2) on the FWIA Card to bypass the governor overspeed switch.

Car Safety Test*(continued)*

4. With the car at the top landing, issue a TST4 Command. The UIT will prompt for overspeed and acceleration rates. Enter the following settings:
 - Overspeed = Governor overspeed trip speed + 10 fpm.
 - Accel = Desired acceleration rate from contract speed to trip speed. The overspeed acceleration rate must be less than or equal to the programmed acceleration value (M39).
 Once entered, the UIT will display:

TST4-OVRSPD TST?
ARMED-REG CALL

5. Issue a bottom terminal landing car call, SCCB Command.
6. After the car reaches top speed, increase the car speed by pressing and holding UDL on the CPUA Card.
7. Verify that the Safety String opens and the car stops in an acceptable distance.

Example UIT display before Safety String activation:

SS=1 699 FPM
CAR SPD: 0699

Example UIT display after Safety String activation:

SS=0 797 FPM
CAR MOVED 142 IN

- Notes:**
- The speed on line 1 will freeze as the Safety String opens (SS=0). The distance noted on line 2 is the distance the car travels after the Safety String is opened.
 - The reported speed may be slightly higher than the plank trip speed because the car is accelerating between the time the plank switch trips and the safety engages.

8. Place the car on Inspection Operation.
9. Install a temporary jumper from CON60:6 (P24) to CON60:4 (SG) on the IOE Card to bypass the car safety gear switch.

Note: With the jumper in place, the car will only be permitted to run on Inspection Operation.

10. Reset the car safety.
11. Reset the governor electrical switch.
12. Verify that there is no damage to the car or hoistway equipment from the test.

Counterweight Safety Test

1. Inhibit the movable jaw of the car governor from engaging and preventing the car safety arm from operating. This action prevents setting of the car safety as it bounces when the counterweight strikes the buffer.
2. To bypass the governor overspeed switch, install a temporary jumper from CON13:1 (MR1) to CON 13:2 (MR2) on the FWIA Card.

Note: Perform the Counterweight Safety Test with car in the lower portion of hoistway. This action will prevent the counterweights from bottoming out and causing damage to ropes due to excessive friction.

3. With the car at the bottom landing, issue a TST4 Command. The UIT will prompt for overspeed and acceleration rates. Enter the following settings:
 - Overspeed = Counterweight governor mechanical switch trips speed + 10 fpm.
 - Accel = Desired acceleration rate from contract speed to trip speed. The overspeed acceleration rate must be less than or equal to the programmed acceleration value (M39).

Once entered, the UIT will display:

TST4-OVRSPD TST? ARMED-REG CALL
--

4. Enter a top terminal landing car call, SCCT Command.
5. After the car reaches top speed, increase the car speed by pressing and holding UDL on the CUPA Card.
6. Verify that the Safety String opens and the car stops in an acceptable distance.

Example UIT display before Safety String activation:

SS=1 699 FPM CAR SPD: 0699

Example UIT display after Safety String activation:

SS=0 797 FPM CAR MOVED 142 IN
--

Note: The speed on line 1 will freeze as the Safety String opens (SS=0). The distance noted on line 2 is the distance the car travels after the Safety String is opened.

7. Place the car on Inspection Operation.
8. Reset the counterweight safety.

Counterweight Safety Test*(continued)*

9. Run the car DOWN 10 to 24 inches to return the governor to the ready position.
10. Reset the car and counterweight governor switches. See Governor Switch Recovery on page 8.
11. Verify that the counterweight stopped within the acceptable distance.
12. Inspect the car and hoistway equipment for damage.

TST5**Unintended Motion Test**

When the Unintended Motion Test is enabled, the ETSD of the electronic governor and the OSP is disabled. After completion of the test, the system automatically returns to normal mode with all safety backup systems enabled.

Before proceeding, verify the following:

- The top and inside of the car under test has been inspected, and all loose objects have been removed.
- All final cab finishes are installed with the car properly counterweighted and the brake verified to hold 125% of the rated load.

Down Direction

1. Position the elevator at the second landing.
2. Place 125% of the rated load into the cab.
3. Issue a TST5 Command. When the UIT prompts, select 'HEAVY'.
4. The UIT will prompt:

UIM TEST? (Y/N)
UP-PRESS & HOLD

To confirm the test, press and hold the UP button until the second line displays 'RELEASE BUTTON'.

Note: If no action is taken within five seconds, the test will abort.

TST5*(continued)*

5. During the test:
 - The drive energizes the normal brake.
 - The car coasts downward and drops the brake (rope gripper, emergency, or sheave).
 - After a time delay of 10 seconds, the normal brake drops and shutdowns the controller by opening the Safety String.

Example UIT display:

SS=0	BRKD=1
CAR MOVED 10 IN	

Observe: The car moves less than 48 inches.

6. Issue a TFR Command.

Note: The car will level into the nearest landing.

Up Direction

1. Position the elevator to the next-to-the-top landing.
2. Issue a TST5 Command. When the UIT prompts, select 'EMPTY'.
3. The UIT will prompt:

UIM TEST? (Y/N)
UP-PRESS & HOLD

To confirm the test, press and hold the UP button until the second line displays 'RELEASE BUTTON'.

4. During the test:
 - The drive energizes the normal brake.
 - The car coasts downward and drops the brake (rope gripper, emergency, or sheave).
 - After a time delay of 10 seconds, the normal brake drops and shutdowns the controller by opening the Safety String.

Example UIT display:

SS=0	BRKD=1
CAR MOVED 10 IN	

Observe: The car moves less than 48 inches.

5. Issue a TFR Command.

Note: The car will level into the nearest landing.

TST7**Ascending Overspeed Test****Required Materials**

This test requires a pendant pushbutton with a normally open contact. The device can be purchased directly from McMaster Carr, Part No. 6944K62 pendant switch cable.



When the Ascending Overspeed Test is enabled, the ETSD System, the NTSD System, and normal limits are disabled. The car is also prevented from decelerating. If the governor jaw or the ascending overspeed device do not activate, the car will stop normally at the call floor. After completion of the test, the system automatically returns to normal mode with all safety backup systems enabled with the exception of the governor switch and/or jaw.

Before proceeding, verify the following:

- All adjacent cars in the hoistway are positioned at the top terminal floor and taken out of service.
 - The top and inside of the car under test has been inspected, and all loose objects have been removed.
 - The Unintended Motion Test (TST5) has passed in the DOWN direction with 125% of rated load.
1. Turn OFF, Lock, and Tag out the mainline disconnect.
 2. Install a temporary jumper from CON13:1 (MR1) to CON13:2 (MR2) on the FWIA Card. This action bypasses the governor overspeed switch.
 3. Connect a normally open pushbutton (PTT) between terminal BK on the power panel DIN rail and A1 on the BRK contactor.
 4. Turn ON the mainline disconnect.
 5. Issue a TST7 Command. The UIT will prompt for overspeed and acceleration rate. Enter the following settings to minimize the overspeed acceleration rate during the test:
 - Overspeed = Ascending overspeed activation point + 10 fpm.
 - Accel = Desired acceleration rate from contract speed to trip speed.

Once entered, the UIT will display:

TST7-OVRSPD TST? ARMED-REG CALL
--

TST7*(continued)*

6. Enter a top terminal landing car call, SCCT Command.
7. As the car accelerates away from the floor, push and hold PTT.
8. After the car reaches top speed, increase the car speed by pressing and holding UDL on the CPUTA Card.

- Notes:**
- In order to overspeed during TST7, press and hold UDL. Releasing UDL will reduce the speed back to contract speed.
 - If the car does not decelerate to the rated buffer speed or the car keeps accelerating, release PTT and UDL to drop the normal brake and abort the test.
9. Once the car has activated the ascending overspeed device and has stopped the car, or the counterweights have struck the buffer(s) at or below the buffer's rated speed, release PTT.
 10. Verify that the ascending overspeed device activates at the proper car speed.

Example UIT display before ascending overspeed device trip:

SS=1 699 FPM CAR SPD: 0699

Example UIT display after ascending overspeed device trip:

SS=0 797 FPM CAR MOVED 142 IN

Note: The speed on line one will freeze as the Safety String opens (SS=0). The distance noted on line 2 is the distance the car travels after the Safety String opened.

Observe: The Safety String opens and the car moves an acceptable distance after the Safety String opens.

Note: This test shows that the emergency brake alone is capable of stopping the car during an overspeed.

11. Place the car on Inspection Operation.
12. Issue a TFR Command.
13. Reset the governor electrical switch.
14. Inspect the car and hoistway equipment for damage.
15. After removing temporary jumpers and returning car to Normal Operation, cycle the elevator at rated speed while on Door Disconnect to verify operation.

TST9**Final Limit Test**

This test will allow the car to run past the normal directional limits on Inspection Operation. The goal of this test is to demonstrate that the final limits are operational. If final limits fail to operate, the car will continue running at Inspection Speed until it hits the buffer.

1. With that car at either the top or bottom terminal landing, place the car on Inspection Operation.
2. Issue a TST9 Command. The UIT will display:

DMD:000 SPD:000 FTSD: ON

Observe: The car stops moving when FTSD changes to OFF.

3. Use Controller Inspection to run the car onto the final limit.
4. Verify that the car stops when the final limit is engaged.
5. Run car to opposite terminal and repeat test.

TST10**125% Rated Load Test – Main Brake****125% Rated Load Test – Emergency Brake**

Make sure 125% Rated Load Test on page 8 has been completed prior to this test.

Before proceeding, verify the following:

- The car is at the bottom landing.
- 125% of the rated load has been placed inside the car.

125% Rated Load Test – Main Brake

1. Enter the TST10 Command. When the UIT prompts, select 'MAIN'.

Example UIT display:

BSLE:1 BSLM:0 TEST TIME: 9

Observe: The emergency brake lifts (BSLE=1) while the main brake stays dropped (BSLM=0). After the test time expires, the UIT will display how far the car moved. The car should move 0 inches.

Note: The test runs for ten seconds. If the car happens to move more than one inch, the test will be aborted.

2. Issue a TFR Command.

125% Rated Load Test – Emergency Brake

1. Enter the TST10 Command. When the UIT prompts, select 'EMERGENCY'.

Example UIT display:

BSLE:0	BSLM:1
TEST TIME: 9	

Observe: The main brake lifts (BSLM=1) while the emergency brake stays dropped (BSLE=0). After the test time expires, the UIT will display how far the car moved. The car should move 0 inches.

Note: The test runs for ten seconds. If the car happens to move more than one inch, the test will be aborted.

2. Issue a TFR Command.

SBM**Traction Loss Detection Test**

This test detects traction loss between the car and motor. Traction loss is defined as either the car moving faster than the motor is turning, or the motor turning faster than the car is moving. If either situation occurs by more than 10 fpm over a period of 10 seconds, the Safety String opens and inhibits motion of the car. This test works within the SBM Command (which puts the controller on bypass mode). Previously, inspectors were allowed to disable certain safety checks on older controllers with this command. The TAC32T controller will not disable any safety checks. It simulates incorrect motor velocity while SBM is active, allowing the controller to simulate traction loss without putting the car in an unsafe operating mode.

1. With the car at the bottom terminal landing, place the car on Inspection Operation.
2. Issue an SBM Command.

Note: Any of these actions will abort the test:

- SBM Command.
- SBM being active for 40 seconds without test or fault.
- Stopping the car once it is running.

3. Run the car UP. While running, the UIT will display:

SPD:050	VEL:035
SAFC=1	RUN:04.43

Observe: SAFC opens (SAFC=0) after approximately ten seconds of run time.

Note: Inspection speeds of less than 50 fpm may fail this test.

Traction Loss Detection Test*(continued)*

4. Cycle power to view fault latch over power cycle.
5. After reset, return to SBM testing screen to verify Safety string is open (SS=0).
6. Issue a TFR Command.

DC Motor Encoder Loss Test

1. Position the car at the bottom landing.
2. Place the car on Inspection Operation.
3. Position the DOOR switch located on the IOE Card to DISC.
4. Disconnect the VEA+ and VEA- wires from the drive.
5. Select Encoder Test from the UIT. The UIT will display the current position of the car and the state of SAFC.

Example UIT display:

POSITION: 35126 SS=1 050 FPM
--

6. Run the car UP.
7. Once the safety circuit opens, the UIT will display the distance traveled by the car.

Example UIT display:

CAR MOVED 14 IN SS=0 050 FPM
--

8. Issue a TFR Command.
9. Replace the VEA+ and VEA- wires to the drive.
10. Remove CON5 from the FWIA Card.
11. Select Encoder Test from the UIT. The UIT will display the current position of the car and the state of the Safety String.
12. Run the car UP.
13. Once the safety circuit opens via SAFC, the UIT will display the distance traveled by the car.
14. Issue a TFR Command.
15. Replace CON5 onto the FWIA Card in the original position.

NTSD Test – Leveling Speed Clamp

The following procedure is intended to verify that the control system independently monitors and limits the leveling speed to a maximum of 150 fpm with the doors open. The TAC32T independently monitors the speed of the system via the NTSD System, located in the NPT subsystem on the IOE Card. This test temporarily reduces the NPT maximum speed with the doors open to 5 fpm (see steps 5 and 6), to show that NPT independently monitors and clamps the speed with the doors open.

1. At a hoistway access floor, place the car on Hoistway Access Operation.
2. Open the doors.
3. Select Leveling Test from the UIT.
4. Monitor the car speed while operating on Hoistway Access Operation.

Example UIT display:

DMD:050 SPD:050 NTSD CLAMP: OFF

Note: The car speed (SPD) will be the same as the demand speed (DMD).

5. Install the jumper PROG_NP on the IOE Card (1-2 positions).
6. Press RSTNP on the IOE Card.
7. Remove PROG_NP jumper (2-3 positions). Steps 5, 6, and 7 set the NPT open door clamp speed to 5 fpm.
8. Monitor the car speed while operating on Hoistway Access Operation.

Example UIT display:

DMD:050 SPD:050 NTSD CLAMP: ON

Observe: The car speed (SPD) is clamped to 5 fpm for one run, then resets the clamp to 150 fpm.

Note: To repeat this test, repeat from step 5.

Cab Phone Monitoring

Authorities Having Jurisdiction (AHJ) Inspection Test Procedure for the Rath Phone Unit

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.

Before the Inspection Demonstration

1. Program the Rath phone before the inspection demonstration with a 10-minute value (default) for the phone line detection timer.

Enter the following sequence on the Rath phone keypad:

Press **Enter** > **3** > **4** > **Enter** > **0010** > **Stop** (for 3 seconds)

AHJ Inspection Procedure

2. Disconnect the active building phone line from the Rath phone unit in the car station. The system will check for an active phone line every 10 minutes (factory default).

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

3. Once the alarms have activated, reconnect the active phone line to the Rath phone unit in the car station.

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 hall station indicator will automatically deactivate.

Hall Station Devices

- To temporarily silence the buzzer, per A17.1 (2.27.1.1.6), set the phone buzzer key switch to **Reset**.
- If an active phone line is not restored within 18 hours, the hall station buzzer will activate.
- The hall station indicator will remain illuminated until an active phone line is restored.

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