



TRACTION ELEVATOR

BASIC ELEVATOR PROCEDURES MAINTENANCE CONTROL PROGRAM

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Safety Notes

NOTE: Throughout this document, the words and letters “All City Elevator” and “ACE” will mean the same thing.

Safety & Emergency

WARNING THE FOLLOWING PROCEDURES ARE INTENDED FOR THE USE OF QUALIFIED AND AUTHORIZED PERSONNEL ONLY. IN THE INTEREST OF YOUR SAFETY AND THE SAFETY OF OTHERS, DO NOT ATTEMPT ANY PROCEDURES THAT YOU ARE NOT QUALIFIED AND AUTHORIZED TO PERFORM.

Safety Guidelines

Service Technicians should strictly adhere to all safety rules in the All City Elevator Safety Handbook.

Unsafe Elevators

WARNING DO NOT WORK ON ANY ELEVATOR UNLESS IT MEETS THE MINIMUM REQUIREMENTS LISTED BELOW

Elevator Minimum Requirements

- Elevator must have car gate or car doors on each entrance
- Elevator must have all hoistway doors in place & working
- All car & hall interlocks must be in working order
- Elevator must have a car top
- Elevator must have full height enclosure (cab)
- Traction elevators must have safeties per applicable code
- Hoistway must be fully enclosed per applicable code
- Unit must be free of all safety hazards and in good operating condition

Safety Precautions

Note: Tools should be in good working order, replace damaged or defective tools.

Terms in the Manual

Specific warnings and cautions will be found throughout the manual as follows:

Damage to Equipment

WARNING A WARNING STATEMENT IDENTIFIES CONDITIONS THAT COULD RESULT IN PERSONAL INJURY IF IMPROPER PROCEDURES ARE FOLLOWED.

CAUTION A CAUTION STATEMENT IDENTIFIES CONDITIONS THAT COULD RESULT IF PROPER PROCEDURES ARE NOT FOLLOWED.

NOTE: A NOTE IS A STATEMENT USED TO CLARIFY THE INSTRUCTIONS AND/OR ADD ADDITIONAL INFORMATION IN AN EFFORT TO AVOID ANY MISUNDERSTANDINGS IN PERFORMING THE PROCEDURE.

Section 1

General Maintenance Service Guide

Traction – Safety & Emergency

Standard Preventative Maintenance

WARNING CAREFULLY READ THESE INSTRUCTIONS BEFORE BEGINNING MAINTENANCE. THESE INSTRUCTIONS ASSUME KNOWLEDGE OF QUALIFIED & AUTHORIZED METHODS & PRACTICES, WITH PROPER CORRECTION OF PROBLEMS ACCOMPLISHED AT THE END OF THE VISIT. MAINTENANCE REQUIRMENTS FOR SOME JOBS MAY DIFFER FROM THOSE DESCRIBED IN THIS MANUAL. REVIEW THESE PROCEDURES CAREFULLY BEFORE ATTEMPTING ANY WORK TO ENSURE THAT THE TASKS CONTAINED HEREIN ARE APPLICABLE TO THE SPECIFIC JOB.

Introduction

The All City Elevator, Inc. maintenance procedures contained in this manual are organized into two categories: During Visits (performed monthly, quarterly, or semi-annually) and annually, (performed annually).

Task Order

Maintenance tasks are listed in the same order as the Traction Maintenance Tasks and Records, yearly record.

Power ON & OFF

Many maintenance tasks are performed with mainline power **ON** and some tasks are performed with mainline power OFF. Throughout these instructions, tasks that are performed with mainline power **OFF** are shown in bold letters as illustrated below.

WARNING FOLLOW PROPER SAFETY & PRECAUTIONS THROUGHOUT MAINTENANCE PROCEDURES TO ENSURE SAFETY WHEN WORKING WITH MAINLINE POWER **ON & OFF**.

Section 2-1

Traction Maintenance

During Each Maintenance Visit, Observe & Adjust/Maintain as Necessary

Hoist Machine & Motor

1. Before taking the car out of service notify the proper building personnel and place “out of service” signs at each landing (as required)
2. Remove power from system using the standard Lock-Out/Tag-Out procedures.

Hoist Machine & Motor

1. Remove power from system using the standard Lock-Out/Tag-Out procedures. With power OFF check the drive sheave for any wear and excessive lubrication build up.
2. Wipe up any oil that may have leaked out of the machine since the last inspection.
3. Inspect the connections to brush rigging and motor fields
4. Check the isolation bushings on the brush rigging.
5. On the hoist motor, check and clean the brush rigging, and check the condition of the brushes and the commutator.

Geared Machine

1. Remove power from system using the standard Lock-Out/Tag-Out procedures. With the power off check the drive sheave for wear and excessive lubrication build up.
2. Wipe up any oil that may have leaked from the machine since the last inspection.
3. Open the inspection plate on top of the gear box and verify that the ring gear is pulling oil into its teeth; check for excessive gear wear.
4. Check the isolation bushings and tie-down bolts.
5. On the hoist motor check and clean the brush rigging with a hand brush and/or compressed air. Check the condition of the brushes and commutator.
6. Check bearings, brushes and commutator on generator.
7. Inspect the connections to brush rigging and motor fields
8. Turn ON the mainline disconnect using the using the standard Lock-Out/Tag-Out procedures.
9. While running the elevator, check for excessive noise, vibrations, and backlash
10. Check the hoist motor for:
 - a. Vibrations & excessive heat at worm shaft
 - b. Arcing at the brushes
 - c. Noise from the bearings
11. If oil slinger rings are present (sleeve bearings), ensure that they carry oil when the car runs.
12. Visually observe the brake operation while running.
13. Observe the bedplate around the wire rope sheave for filings.

Gearless Machine

1. Turn OFF mainline power using the standard Lock-Out/Tag-Out procedures.
2. Check the drive sheave for wear & excessive lubrication build up.
3. Visually observe the brake operation while running.
4. Listen to the machine for any unusual noises as the car runs (rattling/clunking).
5. Observe the bedplate around the wire rope sheave for filings.
6. If oil slinger rings are present (sleeve bearings), ensure that they carry oil when the car runs.
7. Clean the brush rigging and check the condition of the brushes and the commutator.
8. Inspect the connections to brush rigging and motor fields.
9. Visually inspect the drive sheave for unusual wear.

Governor(s) Car, & Counterweight

1. Observe the operation of the governor and listen for any unusual noises.
2. Turn power OFF to prevent car from moving using the standard Lock-Out/Tag-Out procedure. (see Field Safety Handbook)
3. Remove governor cover, clean switches, and lubricate governor per the manufacturer's specifications.
4. Visually inspect fly weight linkages for wear.
5. Reinstall governor cover and return power to the car following the standard Lock-Out/Tag-Out procedures. (see Field Safety Handbook)

Tachometer/Encoder

1. Turn OFF mainline disconnect using standard Lock-Out/Tag-Out procedures. (See Field Safety Handbook)
2. With power OFF check for clean, oil-free surface for the tachometer to run on (if friction driven).
3. Check for proper tension between the tach wheel and driving surface (if friction driven).
4. Check the condition of the tachometer (or encoder) wheel tires for firmness, for bonding to hub, and for alignment: wheel should be true, not lumpy or out of round.
5. Check that the tachometer (or encoder) wheel set screws are tight.
6. Check flange-mounted tachometer (or encoders) for proper alignment. Also check that the coupling set screws and adapter shafts are tight and not broken.
7. Check the tachometer brushes (if available) and blow out the carbon.

Brake Operation

Brake Inspection (Brake Arms Pins)

NOTE: CHECK PRODUCT MANUAL FOR SPECIFIC JOB INFORMATION AND ADJUSTMENTS. SEE MANUFACTURER'S DETAILED SETTINGS.

WARNING ALL BRAKE ADJUSTMENTS ARE CRITICAL; THEREFORE , IF BRAKE RELATED ADJUSTMENTS ARE REQUIRED, NOTIFY YOUR SUPERVISOR IMMEDIATELY SO THE PROPER EQUIPMENT AND PERSONNEL CAN BE DISPATCHED TO THE JOB FOR ADJUSTING AND TESTING.

1. While running the elevator, visually inspect lift and drop of the brake shoes.

WARNING RUN THE CAR TO THE TOP FLOOR PRIOR TO MAKING AND NECESSARY BRAKE ADJUSTMENTS OR CLEANING.

2. Turn OFF the mainline disconnect using the standard Lock-Out/Tag-Out procedure.
3. Check to see if the brake drum has any heat build-up or foreign material.
4. Visually check the brake arm pivot pins and lubricate them with bearing oil.
5. Check all adjustment locknuts for tightness (by hand).
6. Check the brake solenoid plunger for clearances and free movement.
7. Check for collapsed brake spring coils.
8. Check brake micro-switch(es) to ensure it is working properly (if applicable).

Clean & Inspect Machine Room

Before taking the car out of service, notify the proper building personnel, and place “out of service” signs at each landing, (as required).

WARNING ELECTRIC SHOCK 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 TO GROUND MAY BE PRESENT AT MANY POINTS.

Machine Room Inspection

Enter & inspect the machine room for conditions that may have changed since the last inspection, (improper lighting, storage of equipment, proper temperature, etc).

NOTE: REPORT ANY CODE VIOLATIONS OBSERVED TO YOUR SUPERVISOR.

Motor Lubrication

DO NOT OVER/UNDER LUBRICATE! Lubricate the motors as required based on the type of bearings. (See the nameplate, motor application details.)

Cleaning Machine Room.

Check machine room for cleanliness:

- Hoist motor and machine
- Controller (outside only)
- Floor

NOTE: IF CLEANING IS REQUIRED, REMOVE SOILED RAGS FROM PREMISES AND PUT RAGS IN AN APPROVED METAL CONTAINER; DO NOT USE THE OWNER’S DUMPSTER (Follow EPA rules for disposing of hazardous waste materials, or consult your supervisor)

Controller Components

Visually inspect controller for signs of wear or excessive heat & for secure mounting.

Steps to Check Controller Components

1. Turn OFF mainline disconnect using the standard Lock-out/Tag-out procedures. (See Field Safety Handbook)
2. Clean the inside of controller (including components).
3. Visually inspect all wire terminations for stray wire strands, proper spacing between the other conductors, and loose connections.

NOTE: VISUALLY INSPECT FOR CLIP JUMPERS THAT MAY BE PRESENT AND IF ANY ARE FOUND, INVESTIGATE TO DETERMINE WHY THEY ARE PRESENT. IF FOUND, THE CONDITION MUST BE CORRECTED & REPORTED TO YOUR SUPERVISOR.

4. Visually check resistors, transformers and rectifiers for signs of excessive heat and dust.
5. On components P&B, check the contacts on relays 14 & 15 for excessive wear. Verify that the stems are tight. Check that all wire and shunt connections are tight.
6. Check all power relays for proper contact wipe.
7. Check for proper fuse sizes.
8. Check air filters in the controller and card rack (if available). Clean or change as required.
9. Check the SCR heat sinks for excessive dust (blow out if required)

Steps to Check Motor Starters/Contactors.

1. Turn OFF mainline disconnect using the standard Lock-out/Tag-out procedures. (See Field Safety Handbook)
 - a. Inspect the contacts for excessive wear, adequate wipe, and signs of overloading or overheating.
 - b. Clean out dust & filings & replace cover.
2. Check that all mechanical connections on the overload and starter are tight.
3. Confirm proper operation of interlocking device on Y-D starters.
4. On SCR drives, inspect the M contacts for excessive wear & adequate wipe, & signs of overheating.
5. Check the auxiliary contacts of starters and contactors for proper operation, setting, and wire terminations.

Steps to Check Controller

1. Turn OFF mainline disconnect using the standard Lock-out/Tag-out procedures. (See Field Safety Handbook)
2. Check that all terminal connections & components are tight.
3. Turn ON mainline disconnect using the standard Lock-out/Tag-out procedures. (See Field Safety Handbook)
4. Check DC loop overloads (or drive overload) as required by local code.

NOTE: REPORT ANY CODE VIOLATIONS OBSERVED TO YOUR SUPERVISORS. IF REQUIRED COMPLETE BEFORE BRAKE TEAR-DOWN PROCUDURES.

5. Test the reverse phase relay, if applicable.

Rope Gripper Operation

WARNING KEEP HANDS CLEAR AT ALL TIMES WHEN WORKING ON ROPE GRIPPER! FORCES CREATED CAN CAUSE SERIOUS INJURY.

Visual/Periodic Inspection

1. Observe how the ropes pass between the stationary & moveable shoes on the rope gripper. Ropes should be an even distance from the shoes, side to side & top to bottom. Ropes should almost touch the stationary shoe lining.

NOTE: UNEVEN ROPES ON A GRIPPER THAT IS INSTALLED AT A BAD ANGLE WILL CAUSE EXCESSIVE AND ACCELERATED SHOE LINING WEAR. NOTIFY THE ROUTE SUPERVISOR FOR CORRECTIVE ACTION IF THIS CONDITION EXISTS. '

2. Inspect the depth of the groves that the ropes have worn in the shoe lining. A groove depth of 3/16" or a remaining lining thickness of less than 1/16" indicates excessive wear in the shoe lining. The "excessive wear" micro switch will soon keep the rope gripper from resetting.

NOTE: NOTIFY THE ROUTE SUPERVISOR FOR CORRECTIVE ACTIONS (REPLACING SHOE LININGS)

3. Verify the distance the rotating shaft extends up the power cam when the rope gripper is activated (clamping the rope). The rotating cam should make the corner at the bottom and extend about 1/2" up the power cam. If not & assuming that there is adequate lining thickness left, the wear shims can be used to return the rotating shaft to the correct position. Test for proper operation, and shim between movable shoes and support block, if needed.
4. Check the hydraulic fluid level. When the rope gripper is in the "ready" position, the pump reservoir dip stick should show approximately 1" of fluid.

NOTE: LOW HYDRAULIC FLUID IS NOT NORMAL. CHECK FOR LEAKS AND TEST FOR PROPER OPERATION. REPLACE FLUID IMMEDIATELY.

5. Inspect the exposed metal surface and look for a thin layer of general purpose grease on cam surface and the 4 shoe guides.

NOTE: RUST HAS THE POTENTIAL TO CAUSE MALFUNCTION. TEST FOR THE PROPER OPERATION. LIGHTLY LUBRICATE MOVING PARTS.

6. Verify the data tags are attached to the rope gripper and the masses and speeds indicated match or exceed those of the car. (Verified at acceptance). Notify the route supervisor if the rope gripper capacities do not exceed those of the elevator. Remove the elevator from service until corrective action is taken.

Testing for Proper Operation Steps

1. Remove the elevator from service before performing test.
2. Using the on/off test toggle switch on the side of the rope gripper pump unit, move it to the off position. The rope gripper should deactivate and set. Return on/off test toggle to on after test.

Motor Generator Set

1. Observe the motor generator operation and listen for any unusual noise or arcing.
2. Disable the motor generator using the standard Lock-Out/Tag-Out procedure. (See Field Safety Handbook)
3. Remove the brushes from the brush holders after the armature stops rotating.
4. Clean the brush holders and rigging with a hand brush and/or compressed air.
5. Check the armature shaft on the DC end next to the bearing housing and clean all the carbon from the shaft.
6. Check the condition of the commutator for high bars, threading, burning, lack of chamfered edges, and firm polish.
7. Check the slots on the commutator between bars for "high mica".
8. Check the general armature condition, such as solder connections, lose riser connections, condition of the insulation, thrown solder, or thrown balance weights.
9. Check the generator armature readings.
 - a. With a digital meter, set the meter on the highest Ohm scale.
 - b. Connect the meter lead to a good ground.
 - c. Touch the other meter lead to the commutator bars at 90° intervals, and record the readings.
 - d. If any generator armature reading is indicating a low resistance to ground, report it to your supervisor.

NOTE: NORMALLY THIS SHOULD BE AN INFINITE READING OR VERY HIGH RESISTANCE.

Selector & Related Components

Motor Room Selector

1. Turn OFF the mainline disconnect by using standard Lock-Out/Tag-Out procedure.
2. With power OFF temporarily remove any covers and guards protecting the selector system to allow for proper inspection. The selector system can be better observed later while the car is running at contract speed.
3. Visually inspect the drive gears for signs of wear and lubricate as required.
4. Visually inspect the leveling carriage shoe for signs of wear. Manually try to move the selector drive worm bearings horizontally to check for bearing wear or loose bearing plates.
5. Visually inspect all selector contacts for signs of wear. Check for proper clearances between the sensors and the floor cams.
6. Visually inspect the entire drive system for signs of wear.
7. Check all selector brushes and carbon brushes for wear.
8. Check all lanes for good contact.
9. Check for excessive dirt or dust build up on the selector. Brush off as necessary.
10. If microswitch leveling is used, check the cams for signs of wear.
11. If optical leveling is used, with a clean dry cloth, clean any optical leveling sensors.
12. Check the wire terminations on the sensors.
13. Turn On the mainline disconnect and run the elevator and visually inspect that the cams are aligned in the leveling sensors. Insert a small piece of standard white paper in each sensor to test the sensor strength. The LED on the card should not turn on when a single thickness of paper is inserted.
14. If Idler sheaves are used, run the elevator to observe the selector cable as it moves over the idler sheaves for excessive vibration, wear, and proper alignment.

NOTE: CHANGING THE HEIGHT AND DEPTH OF THE CARRIAGE WILL CHANGE THE RIDE PERFORMANCE.

15. Turn mainline power OFF using the standard Lock-Out/Tag-Out procedure.
16. Reinstall any covers or guards previously removed to perform the inspection and maintenance.

17. Turn On the mainline disconnect.
18. Run elevator on automatic to check floor levels and proper operation.

Car Top Guide Shoes/Roller Guides

Before taking the car out of service notify the proper building personnel and place “out of service” signs at each landing (as required).

WARNING PRIOR TO ENTERING THE HOISTWAY ALL ACE SAFETY POLICIES MUST BE PERFORMED. BEFORE STEPPING ONTO THE CARTOP, VISUALLY INSPECT FOR EXCESSIVE GREASE OR OIL.

Shoes

1. Inspect the top guide shoes for proper clearances, adjustments, wear & lubrication.
2. Lubricate guide rails if required.

NOTE: APPLY LUBRICATION AS NECESSARY PER MANUFACTURERS RECOMMENDATIONS

Rollers

Inspect the car top rollers for proper clearances, adjustments and wear. Check rollers for signs of wear or deterioration. Rollers should be centered and plumb on the face of the rail. They should track evenly across the face of the rail as the car moves. Each roller should be tensioned to the face of the rail, enough to hold the car centered in the guides. Grasp each roller individually and turn the roller in the up and down directions. Each roller should slip on the rail face with moderate twisting force. All rollers should have the same amount of tensioning force on them regardless of the manufacturer. All of the rollers should be of the same material and size. Excessive roller pressure against the face of the rail will result in premature roller wear, damaging the friction surface of the roller, the roller bearings or both. Refer or OEM product manual for instruction on maintenance, alignment methods and adjusting procedures.

Counterweight Guide Shoes/Roller Guides

Before taking the car out of service notify the proper building personnel and place “out of service” signs at each landing (as required).

WARNING PRIOR TO ENTERING THE HOISTWAY ALL ACE SAFETY POLICIES MUST BE PERFORMED. BEFORE STEPPING ONTO THE CARTOP, VISUALLY INSPECT FOR EXCESSIVE GREASE OR OIL.

Run the car up or down the hoistway until access to the top or bottom of the counterweight frame can be obtained. Remember to active the car stop switch prior to reaching beyond the boundaries of the platform to inspect the counterweight assemblies.

Inspect the counterweight rollers or slide guide shoes for proper clearances, adjustments, wear, and lubrication. Check rollers for signs of wear or deterioration. Rollers should be centered and plumb on the face of the rail.

Check that they track evenly across the face of the rail as the car moves. Each roller should be tensioned to the face of the rail enough to hold the counterweights centered in the guides. Grasp each roller individually, and turn the roller in the up and down directions. Each roller should slip on the rail face with moderate twisting force. All rollers should have the same amount of tensioning force on them regardless of the manufacture. All rollers should be of the same material and size.

Excessive roller pressure against the face of the rail will result in premature roller wear, damaging the friction surface of the roller, the roller bearings or both. Refer to the OEM product manual for instruction on maintenance, alignment methods, and adjusting procedures.

Car Top Optical Sensors/Leveling Devices and Car Top Selector

Optical Sensors

1. Check for proper clearance of the leveling vane and NTSD vane.
2. Clean the optical sensors (as required) with a clean, dry cloth.

Magnetic Leveling and Slowdown Switches

NOTE: IF CLEANING THE OPTICAL SENSORS WITH THE CAR ON INSPECTION THE LOWER PIT STOP SWITCH ON, POSITION THE CAR SO THAT YOU CAN SEFELY GET OFF AT A LANDING IN THE EVENT THE CLEANING CAUSES A FAULT THAT WOULD NOT ALLOW THE CAR TO RUN AFTER CLEANING IS COMPLETE.

1. If the job has MV4 units for leveling and slowdowns, check that the maximum clearance of the inductor unit to the vane is 1/8" to 1/4".
2. If the job has "horseshoe" type magnetic vanes check for the proper clearance (between 3.8" and 1.75" minimum vane engagement).

Car Top Selector (Tape & Guides)

1. Inspect the top of the tape guide for signs of plastic dust build-up from guide wear.
2. If excessive dust is present, wipe it off with a clean, dry cloth.

NOTE: WHERE CONDITIONS EXSIST FOR RUST, LUBRCATE THE TAPE WITH A SILCONE-BASED LUBRICANT.

3. Remove a guide from each side and check it for wear. No grooves should be visible.
4. If wear is present, reverse (or replace) all selector guides, and check that the selector box and tape assembly are plumb.
5. On LMT units check the top and bottom of the aligning rollers on the selector to ensure that they are free. Lubricate them as necessary.

NOTE: ADJUSTMENTS NUTS ARE LOCATED ON THE ECCENTRICS.

6. Check that the mounting bolts are tight.
7. Visually inspect the cards for excessive dust.
8. If cleaning is necessary, follow instructions below.
 - a. Turn OFF the mainline disconnect in the standard Lock-out/Tag-out procedure.
 - b. Dust the card with ESD safe brush or compressed air.
 - c. Using he standard Lock-out/Tag-out procedures, restore power to the system.

TOP OF CAR OPERATING {INSPECTION} DEVICE, INCLUDING STOP SWITCH, & LIGHT

Before taking the car out of service, notify the proper building personnel and place "out of service" signs at each landing (as required).

WARNING PRIOR TO ENTERING THE HOISTWAY ALL ACE SAFETY POLICIES MUST BE PERFORMED. BEFORE STEPPING ONTO THE CARTOP, VISUALLY INSPECT FOR EXCESSIVE GREASE OR OIL.

Access the top of the car through the preferred OEM method, as noted in the OEM product manual.

1. Turn the car top light on before stepping onto the top of the car. Place the car on car top inspection by activating the inspection switch. Then place the RUN/STOP switch in the “stop” position.
2. Once situated in a safe place on the car top close the car door(s) if needed, and then the hoistway door(s) used to gain access to the car top. There should be absolutely no movement of the car at this time.
3. Locate the utility power receptacle. It should be of the GFCI type. Press the test button on the GFCI receptacle, noting the OEM test status indicator. If the test fails, replace the GFCI receptacle with a new working unit. If the test is successful, press the reset button on the unit.
4. Press the safety interlock and Down inspection buttons located on the top of the car inspection station simultaneously. There should be no movement of the car. Release the safety interlock and Down inspection buttons
5. Press the safety interlock and Up inspection buttons located in the top of the car inspection station simultaneously. There should be no movement of the car. Release the safety interlock and Up inspection buttons.
6. Momentarily press the Up, Safety Interlock, & Down buttons individually for a few seconds each, noting no car movement.
7. Reopen the car door so that the gate switch is not actuated. Return the top of the car Stop Switch to its RUN position and retest the inspection direction switches as noted in steps 4-6. If the car did not move, place the RUN/STOP switch into the stop position and close the car door(s).
8. Reopen the hoistway door(s) just enough to deactivate the hoistway door interlock. Return the top of car Stop Switch to its RUN position and retest the inspection direction switches as noted in the steps 4-6. If the car did not move, reactivate the top of the car Stop Switch and close the hoistway door(s).
9. Press the safety interlock and down inspection buttons located in the top of car inspection station simultaneously. The car should move down at inspection speed. Release the safety interlock and down inspection buttons to stop the car.
10. Press the safety interlock and up inspection buttons located in the top of car inspection station simultaneously. The car should move up at inspection speed. Release the safety interlock and up inspection buttons to stop the car.

All other top of car maintenance functions can be performed at this time.

NOTE: WHENEVER THE CAR IS STOPPED FOR AN EXTENDED PERIOD OF TIME AND ANY MAINTENANCE OR REPAIR FUNCTION IS PERFORMED THAT REQUIRES ANY PART OF THE BODY TO BE EXTENDED PAST THE BOUNDARIES OF THE CAR, IT IS ADVISED TO ACTIVATE THE STOP SWITCH TO HELP GUARD AGAINST INJURY DUE TO UNINTENDED MOVEMENT OF THE CAR.

Emergency Light

Some jobs may have an emergency light unit on top of the car and require this test to be performed from the top of the car.

WARNING PRIOR TO ENTERING THE HOISTWAY ALL ACE SAFETY POLICIES MUST BE PERFORMED. BEFORE STEPPING ONTO THE CARTOP, VISUALLY INSPECT FOR EXCESSIVE GREASE OR OIL.

1. Access to Emergency Light unit
2. Test the Emergency Light (as required) based on the type of unit.
 - a. While holding the test button, momentarily press the alarm button and verify the alarm bell rings.
 - b. Release the test button and verify that the Emergency Light goes out.
 - c. Press the alarm button again and verify it still rings.
 - d. With normal 110-120 VAC power on the car, press the “test button” on the Power-Pack and verify the Emergency Light turns on. If there is not a Test button, remove 110-120 VAC from the circuit at the motor room disconnect and check.

NOTE: IF THERE IS NOT A TEST BUTTON, REMOVE 110-120 VAC POWER FROM CAR AND VERIFY THAT THE EMERGENCY LIGHT AND THE ALARM BELL BOTH WORK. ALSO VERIFY THAT THE EMERGENCY PHONE WORKS.

Clean & Inspect Car Top Devices

Before taking the car out of service, notify the proper building personnel and place “out of service” signs at each landing (as required).

WARNING PRIOR TO ENTERING THE HOISTWAY ALL ACE SAFETY POLICIES MUST BE PERFORMED. BEFORE STEPPING ONTO THE CARTOP, VISUALLY INSPECT FOR EXCESSIVE GREASE OR OIL.

NOTE: PERFORM RISK ASSESSMENT IF IT IS NECESSARY TO DEVIATE FROM ACE STANDARD SAFETY PROCEDURES FOR ACCESSING ANY CAR TOP OR PIT, OBTAIN SUPERVISOR APPROVAL BEFORE PROCEEDING.

Follow the instructions in this section for placing the elevator on car top inspection in tasking instructions for “Top of Car Operating (Inspection) Device Including Stop Switch and Light”

1. Use of a vacuum is desirable, but if it is not present, a small 4” paint brush can be used to “sweep” the car top and surrounding structures. Be careful to keep airborne dust to a minimum, as it tends to adhere to or interfere with critical optical and moving components in the hoistway. Do not use “Tornado” blowers or vacuum cleaners in reverse, as the discharge from these devices places high static charge on the surfaces they contact.
2. Run the car on inspection to the lowest landing and remove any dirt.

Hoistway Doors, Tracks, and Door Locks

Before taking the car out of service, notify the proper building personnel and place “out of service” signs at each landing (as required).

WARNING PRIOR TO ENTERING THE HOISTWAY ALL ACE SAFETY POLICIES MUST BE PERFORMED. BEFORE STEPPING ONTO THE CARTOP, VISUALLY INSPECT FOR EXCESSIVE GREASE OR OIL.

NOTE: TO BE PERFORMED ON ALL DOORS. REFER TO SPECIFIC HOISTWAY DOOR PRODUCT MANUAL FOR SPECIFICATIONS AND REPLACEMENT PARTS.

1. Secure access to the top of the elevator observing all ACE safety procedures.
2. Position elevator to a safe and comfortable working height using the car top controls.
3. Manually open the doors and observe the operation of the closer through the full range of the opening. Listen for any dragging or rubbing. Inspect door tracks; clean and/or remove any build up on tracks and lubricate as needed, per OEM product manual.
4. Check all fastenings for tightness; lubricate pivot points as required.
5. Check gibs for tightness and wear; replace if required. Check fire tabs on gibs.
6. Observe proper clearances ¼”-3/8” around and under door panel. Check the up thrust roller for proper clearances (0.008 inch)
7. Manually release the pick-up rollers and check interlock for proper clearances and adjustment. Inspect and clean contacts if required.
8. Confirm that the car will not move with the doors open when trying to run on inspection.
9. Examine the sight guards, astragals and dust cover for wear and tightness.

NOTE: REPORT ANY DEVIATIONS TO YOUR SUPERVISOR.

10. Inspect entire sill and clean as necessary.

Car Door, Gate Equipment, & Operator

Before taking the car out of service, notify the proper building personnel and place “out of service “ signs at each landing (as required).

WARNING ELECTRIC SHOCK CAN CAUSE PERSONAL INJURY OR LOSS OF LIFE. CIRUIT BREAKERS, SWITCHES, & 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 TO GROUND MAY BE PRESENT AT MANY POINTS. SEE THE FIELD SAFETY HANDBOOK.

WARNING PRIOR TO ENTERING THE HOISTWAY ALL ACE SAFETY PROCEDURES MUST BE FOLLOWED. BEFORE STEPPING ON TO THE CARTOP VISUALLY INSPECT FOR EXCESSIVE GREASE OR OIL.

Perform a visual check of the door operator power transfer belts, wire ropes, lead screws, and/or linkage. Replace any worn or defective parts according to the OEM guidelines as stated in the OEM product manual.

Visually check the door rollers & hanger assemblies for any wear or damage. Use a small 4” paint brush to remove any dust or airborne contaminants that have adhered to any of the door equipment surfaces. Be careful not to misalign any switches or actuating cams associated with the door operator or the surrounding equipment. The door track surface should be lightly polished with “scotch bright” or other similar cleaning material, paying special attention to the debris build up that forms at the point on the door track where hanger rollers stop when the doors are in the fully closed & fully open positions.

Visually inspect the clutch and linkage associated with the car door locking device if appropriate. Use the OEM instruction in the equipment product manual to test, adjust & renew the operation of damaged parts for the above mentioned equipment.

Inspect the door reopening device(s) travel cabling for any wear, tears, or cracking of the outer insulation, paying close attention to the stationary tie points. This is where most failures of the traveling cable(s) will occur. Inspect, adjust and test any linkages and switches if the door reopening device is the mechanical type. Reference the OEM product manual for tolerances and instructions. If photo electric “eyes” are incorporated into the door reopening scheme, ensure that the lenses of the transmitter(s) and receivers(s) are clean and aligned according to the OEM product manual instructions.

The door gib sill groove (if applicable) should be clean and free of any debris. The fasteners that hold the car door sill rigid to the platform should all be secure. Visually inspect each gib for noticeable wear, and renew per OEM instructions. Check the tongues or tabs for proper placement.

Ensure that the doors open & close with a minimum amount of noise, and that the doors are free in the sill grooves throughout the range of movement.

Ensure that all the gib fasteners are secure per the OEM instructions.

Verify proper operation of the following components: Car Stop Switches(s), Emergency Communications, Signals/Buttons, Alarm (Optional Switches/Buttons), Emergency Light & Ventilation.

Before taking the car out of service, notify the proper building personnel and place “out of service” tags at each landing (as required).

WARNING ELECTRIC SHOCK CAN CAUSE PERSONAL INJURY OR LOSS OF LIFE. CIRUIT BREAKERS, SWITCHES, & 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 TO GROUND MAY BE PRESENT AT MANY POINTS. SEE THE FIELD SAFETY HANDBOOK.

Car Bottom Guide Shoes/Roller Guides

Before taking the car out of service notify the proper building personnel and place “out of service” signs at each landing (as required).

1. Run the car up high enough to safely access the pit, stop switch, pit light and bottom guides. Secure the car using the standard lock-out/tag-out procedures. (See Field Safety Handbook) Set up barricades at bottom landing as required before accessing the pit.

NOTE: BEFORE ENTERING THE PIT. CHECK WITH THE APPROPRIATE BUILDING PERSONNEL AND DETERMINE IF THE PIT AREA IS CLASSIFIED BY THE PROPERTY OWNER/MANAGER AS A PERMIT REQUIRED CONFINED SPACE.

WARNING BEFORE ENTERING THE PIT , OPEN THE PIT STOP SWITCH. BEFORE STEPPING INTO THE PIT, VISUALLY CHECK FOR EXCESSIVE GREASE OR OIL. PERFORM RISK ASSESSMENT: IF IT IS NECESSARY TO DEVIATE FROM THE ACE SAFETY ACCESS PROCEDURES, OBTAIN SUPERVISOR APPROVAL BEFORE PROCEEDING.

2. Turn the pit light on and open the pit stop switch.

Shoes

1. Inspect the bottom guide shoes for proper clearances, adjustments, wear, and lubrication.
2. Lubricate guide rails if required.

Rollers

1. Inspect the car bottom guide shoes/roller guides for proper clearances, adjustments and wear.
2. Check rollers for signs or wear or deterioration.
3. Rollers should be centered and plumb on the face of the rail. They should track evenly across the face of the rail as the car moves. Each roller should be tensioned to the face of the rail enough to hold the car centered in the guides.
4. Grasp each roller individually and turn the roller in the up & down directions, verifying proper tension.

NOTE: APPLY LUBRICATION AS NECESSARY PER MANUFACTURER RECOMMENDATIONS.

Clean & Inspect Pit Area, Pit Lighting, & Pit Stop Switch

Before taking the car out of service notify the proper building personnel and place “out of service” signs at each landing (as required)

Pit Inspection

1. Go to pit area. Set the barricades up at the bottom landing. Run the elevator up above the bottom landing to give clear access to the pit. Secure the elevator using proper Lock-Out/Tag-Out procedures.

NOTE: BEFORE ENTERING THE PIT. CHECK WITH THE APPROPRIATE BUILDING PERSONNEL AND DETERMINE IF THE PIT AREA IS CLASSIFIED BY THE PROPERTY OWNER/MANAGER AS A PERMIT REQUIRED CONFINED SPACE.

WARNING BEFORE ENTERING THE PIT , OPEN THE PIT STOP SWITCH. BEFORE STEPPING INTO THE PIT, VISUALLY CHECK FOR EXCESSIVE GREASE OR OIL. PERFORM RISK ASSESSMENT: IF IT IS NECESSARY TO DEVIATE FROM THE ACE SAFETY ACCESS PROCEDURES, OBTAIN SUPERVISOR APPROVAL BEFORE PROCEEDING.

2. Turn the pit light on and open the pit stop switch
3. Enter and inspect the pit for conditions that may have changed since the last inspection (improper lighting, ladders, etc., or any water in the pit).

NOTE: REPORT ANY CODE VIOLATIONS FOUND TO YOUR SUPERVISOR

Clean Pit

1. Visually inspect and/or clean the pit as needed according to the contract to keep the pit free of debris. Be mindful of smoke detectors in the pit area.
2. Once pit work is complete, remove cleaning supplies and debris, exit the pit and restore power to the system using the standard Lock-Out/Tag-Out procedure.

NOTE: INFORM BUILDING MANAGER OF ANY STANDING WATER!

Spring Buffers

Visually inspect the spring buffers for secure mounding, corrosion, or other defects, and proper tags.

Oil Buffers

Visually inspect the oil buffers for any leaks, proper switch adjustments, or physical defects such as secure mounting, corrosion or other defects and for proper tags.

Pit Equipment

1. Inspect compensation sheaves, wire ropes, and/or chains.
2. Lube pit equipment as required.

Stopping Accuracy

Floor Level

1. Enter the elevator & check all floor levels for a rough estimate of the car's position to the hoistway floor.
2. Perform high-speed run when possible. Move from top floor to one floor down (worst possible leveling condition).

NOTE: A PRECISE FLOOR LEVEL OF 1/2" OR LESS IS REQUIRED.

WARNING IF LEVELING VARIANCE IS GREATER THAN 1/2", THE ELEVATOR SHOULD BE SHUT DOWN UNTIL THE PROBLEM CAN BE RESOLVED.

Car Stop Switch(es), Emergency Communications, Signals, Buttons, Alarm,

Emergency Light, & Ventilation

Car Stop Switch(es)

While the car is stopped at one of the floors, if the car stop switch is a manual push button type, operate it briefly. Ensure that when the switch is activated, the alarm bell rings, and the doors do not close. If the stop switch is the keyed type, actuate it with the proper key inserted and make sure the doors do not close.

Emergency Communications

Inspect the operation of the phone and intercom (hall to car) or any other Emergency Communication devices & notify your supervisor, (prior to leaving the job) if it is not working properly.

NOTE: IF THE JOB HAS NO EMERGENCY COMMUNICATIONS, REPORT THE CONDITION TO YOUR SUPERVISOR.

Signals, Buttons

1. Push all car calls in the operating panel to check car calls and lamps.

2. Check the position indicators as the car travels the hoistway.
3. Observe the operation of the floor passing tones (if the car is equipped with handicapped features).
4. As the car stops at each floor, push all hall call buttons to check hall calls and lamps.
5. Check the hall lanterns and gongs at each floor and the car riding lantern gongs (if provided).

Alarm

1. Test Emergency Alarm and any other signals for proper function.

Emergency Light

1. Access the emergency light unit.
2. Test the Emergency light (as required) based on the type of unit
 - a. With normal 110-120 VAC power on the car, press the “test button” on the power-pack. Verify that the Emergency Light turns on
 - b. While holding the test button momentarily press the alarm button and verify the alarm bell rings.
 - c. Release the test button and verify that the Emergency Light goes out
 - d. Press the alarm button again and verify that it still rings.

NOTE: SOME JOBS MAY HAVE THE EMERGENCY LIGHT UNIT ON TOP OF THE CAR AND REQUIRE THIS TEST TO BE DONE FROM THE TOP OF THE CAR. SEE “TOP OF CAR OPERATING {INSPECTION DEVICE}, INCLUDING STOP SWITCH, & LIGHT “, IN THIS SECTION.

Ventilation

Check ventilation to ensure that it functions as intended by checking each fan speed.

Door Close Force

Door Torque

1. Place the gauge against the leading edge of the car door.
2. Operate the doors electrically. As the door closes, hold the door back to reduce the door speed until the doors stall out on the gauge within the center third of door travel.
3. Manually apply pressure to the door in the opening direction to reduce the torque reading.
4. Gradually release the pressure applied to the door allowing the torque reading to increase to a maximum value. Read and note this torque value.

NOTE: BY CODE, THE FORCE MUST NOT EXCEED 30 LB (POUNDS-FORCE): SEE RULES 112.1 OF ASME 17.1E-1987 CODE.

Car Door Reopening Devices

Before taking the car out of service, notify the proper building personnel, and place “out of service” signs as each landing, (as required).

1. Allow the elevator door to start to close and check that the safety edge, when retracted, will reopen the doors from mid-travel and at 3” from fully open. Perform this same test using the door open button.
2. Verify that the safety edge or infrared curtain unit can be activated with the doors FULLY OPEN.

NOTE: IF THE ELEVATOR IS EQUIPPED WITH ANOTHER REOPENING DEVICE, ACTIVATE IT TO ENSURE THAT THE DOOR REOPENS.

NOTE: IF THE JOB IS EQUIPPED WITH THE LIMITED DOOR REVERSAL OPTION, DOOR SHOULD REOPEN TO ABOUT TWO THIRDS OPEN, THEN CLOSE.

3. If photo eyes are installed on the unit, allow the doors to start to close and then break the light beam with your hand at 5" and 29" above the car sill to check that the doors reopen.

NOTE: TO GET THE ACCURATE TEST OF THE BEAM, BE CAREFUL NOT TO TOUCH THE LIGHT CURTAIN WITH YOUR HANDS.

4. Clean photo eyes or wipe down light curtains.
5. Visually check the door operator arms, car door rollers, relating wire ropes, clutch, restrictor, & safety edge/photo eyes are securely fastened and function properly.
6. Lubricate pivot points if required.
7. Check belts for wear, cracking, and stretch. Make repairs and adjust as necessary.
8. Notify the proper building personnel that work is completed. Put the car back in service.

NOTE: REPORT ALL OBSOLTE AND BADLY WORN SAFETY EDGES TO A SUPERVSROR FOR POTENTIAL REPLACEMENT.

WARNING IF THE PHOTO EYE OR LIGHT CURTAIN HAS BEEN TURNED OFF, SHUT DOWN THE ELEVATOR FOR SAFETY REASONS UNTIL THE ISSUE WITH THE PHOTO EYE OR LIGHT CURTAIN CAN BE RESOLVED.

Section 2-2

Traction Maintenance

Annually Inspect These Items & Observe & Adjust/Maintain as Necessary

Brake

Brake Inspection

WARNING ALL BRAKE ADJUSTMENTS ARE CRITICAL; THEREFORE, IF BRAKE RELATED ADJUSTMENTS ARE REQUIRED NOTIFY YOUR SUPERVISOR IMMEDIATELY SO THAT EQUIPMENT AND PERSONNEL CAN BE DISPATCHED TO THE JOB FOR ADJUSTING AND TESTING.

Before taking the car out of service notify proper building personnel and place “out of service” signs at all landings (as required).

1. While running the elevator visually inspect lift and drop of the brake shoes.
2. Run car to top floor and remove from service using the standard Lock-Out/Tag-Out procedure. See Field Safety Handbook.
3. Check to see if brake drum has any heat build-up.
4. Visually check the brake arm pivot pins and lubricate them with bearing oil.
5. Check all adjustment locknuts for tightness (by hand).
6. Check the solenoid pin for clearance and free movement .
7. Check for collapsed brake spring coils.
8. Check brake micro-switch(es) to ensure it is working properly (if applicable)
9. Check brake pad for wear and/or thickness.

PC Cards

Before taking the car out of service notify proper building personnel and place “out of service” signs at all landings (as required).

WARNING ELECTRIC SHOCK 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 TO GROUND MAY BE PRESENT AT MANY POINTS. SEE FIELD SAFETY HANDBOOK.

1. Remove power to the controller using the standard Lock-Out/Tag-Out procedure. (See Field Safety Handbook)
2. Ensure equipment is protected from static discharge through proper grounding practices.
3. Remove PC cards from connector and clean the edges of contacts.

NOTE: ALWAYS FOLLOW THE MANUFACTURERS RECOMMENDATIONS ON THE CLEANING AND MAINTENANCE OF CONTACTS.

4. Use approved methods for cleaning the cards.
5. Reinstall the cards and ensure the elevator is operational.
6. Repeat as needed.
7. Verify correct voltage from power supplies and adjust as needed.

Overhead, Car Top, & Hoisting Sheaves

Before taking the car out of service notify proper building personnel and place “out of service” signs at all landings (as required).

WARNING PRIOR TO ENTERING THE HOISTWAY ALL ACE SAFETY POLICIES MUST BE FOLLOWED! BEFORE STEPPING ONTO THE CAR TOP, VISUALLY CHECK FOR EXCESSIVE GREASE OR OIL.

1. Run the car down from the top landing to access the top of car; place barricades as required.
2. Follow the OEM instructions for placing the elevator on car top inspection as noted in the “Top of Car Operating {Inspection} Devices Including Stop Switch & Light).
3. Refer to the manufacture’s product manual for inspection, lubrication, maintenance, and adjusting procedures for overhead, car top, and counterweight sheaves.

Hitch Plates & Rope Fastenings

Before taking the car out of service notify proper building personnel and place “out of service” signs at all landings (as required).

1. Move the car to the appropriate landing to access the car top. Before accessing the car top, place the stop switch in the STOP position and ensure its proper operation.

WARNING PRIOR TO ENTERING THE HOISTWAY ALL ACE SAFETY POLICIES MUST BE FOLLOWED! BEFORE STEPPING ONTO THE CAR TOP VISUALLY CHECK FOR EXCESSIVE GREASE OR OIL.

2. Place car top inspection switch to “INSP” position.
3. Inspect hitch plate.
4. Ensure the anti-spin wire rope is install properly. Check for collapsed or broken springs on the shackles.
5. Check that the proper tags are attached and shackle nuts are tight and pinned.
6. Inspect shackles, look for cracks, loose wire strands in the wedges or babbitt and that the shackle rods are not damaged or bent.

Counterweight Frame, Sheave & Safeties

Before taking the car out of service notify proper building personnel and place “out of service” signs at all landings (as required).

1. Inspect frame for cracked or broken frame, and counterweights secured within the frame.
2. Inspect slide or roller guides.
3. If applicable inspect counterweight safety and governor rope. Verify all bolts, fasteners, and cotter pins are properly secured. Ensure proper clearance from throat to rail.
4. If applicable (and located in the machine room or secondary), inspect the counterweight governor sheave, flyweights, and switches. Ensure tags are correct.

Car Safeties & SOS

Before taking the car out of service notify proper building personnel and place “out of service” signs at all landings (as required).

WARNING BEFORE ENTERING THE PIT, OPEN THE PIT STOP SWITCH. BEFORE STEPPING INTO THE PIT, VISUALLY CHECK FOR EXCESSIVE GREASE OR OIL. PERFORM RISK ASSESSMENT; IF IT IS NECESSARY TO DEVIATE FROM THE ACE SAFETY ACCESS PROCEDURES OBTAIN SUPERVISOR APPROVAL BEFORE PROCEEDING.

1. Inspect all working parts of car safeties to verify that they are in satisfactory operating condition.
2. Inspect wedges and soft set safeties to verify operation.
3. Ensure that SOS switch is functional.

8.11.2.2 – Periodic Test Requirements, Category 1 Testing Procedure

Traveling Cable(s)

Before taking the car out of service notify the proper building personnel and place “out of service” signs at each landing (as required)

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WARNING BEFORE ENTERING THE PIT, OPEN THE PIT STOP SWITCH. BEFORE STEPPING INTO THE PIT, VISUALLY CHECK FOR EXCESSIVE GREASE OR OIL. PERFORM RISK ASSESSMENT; IF IT NECESSARY TO DEVIATE FROM THE ACE SAFETY ACCESS PROCEDURES OBTAIN SUPERVISOR APPROVAL BEFORE PROCEEDING.

1. Go to the pit area. Set barricades up at bottom landing. Run the elevator up above the bottom landing to give clear access to the pit. Secure the elevator using standard Lock-Out/Tag-Out procedures.
2. From the pit, confirm the traveling cable(s) are not making contact with foreign objects or is improperly tracking. Take corrective action if required. Inspect the entire length of traveling cable jacket for cracks, cuts, tears, abnormal wear or severe twists. Inspect hanging devices used to alleviate undue strain on the traveler.

WARNING PRIOR TO ENTERING THE HOISTWAY ALL ACE SAFETY POLICIES MUST BE FOLLOWED! BEFORE STEPPING ONTO THE CAR TOP VISUALLY CHECK FOR EXCESSIVE GREASE OR OIL.

3. Next move to car top while running on inspection. Confirm the traveling cable has no contact with foreign objects or is improperly tracking, take corrective action if required. Inspect entire length of traveling cable jackets for cracks, cuts, tears, abnormal wear or severe twists. Inspect hanging device used to alleviate undue strain on the traveler. Inspect the traveler where the cable enters/leaves the hoistway.

Directional/Final Limits

Before taking the car out of service notify proper building personnel and place “out of service” signs at all landings (as required).

WARNING PRIOR TO ENTERING THE HOISTWAY ALL ACE SAFETY POLICIES MUST BE FOLLOWED! BEFORE STEPPING ONTO THE CAR TOP VISUALLY CHECK FOR EXCESSIVE GREASE OR OIL.

1. Visually inspect the limit actuating device(s) as well as the alignment of the limit device(s) themselves to ensure proper engagement. The actuating device should be sufficient in length and the limit devices adjusted so that they will stay active from the point of contact through the physical limits of car motion (buffer fully compressed).

NOTE: SOME NORMAL DIRECTIONAL LIMIT SWITCHES ARE LOCATED ON THE SELECTOR SYSTEM.

2. With the car on inspection, move the car down or up until the normal direction limit is engaged and the car comes to a complete stop. Then demand direction should be reversed and the car allowed to travel a short distance to ensure that the final limit device has not been operated at the same time as the normal limit.

NOTE: ON ELEVATORS WITH SPRING BUFFERS, NORMAL/DIRECTIONAL LIMIT WILL STOP THE CAR BEFORE CONTACT WITH THE BUFFERS.

3. Actuate the final limit manually to verify that the safety circuit has opened and the car will not move in either direction.
4. Repeat at opposite terminal.

Rail Mounted Roller Switches

Before taking the car out of service notify proper building personnel and place “out of service” signs at all landings (as required).

WARNING PRIOR TO ENTERING THE HOISTWAY ALL ACE SAFETY POLICIES MUST BE FOLLOWED! BEFORE STEPPING ONTO THE CAR TOP VISUALLY CHECK FOR EXCESSIVE GREASE OR OIL.

WARNING BEFORE ENTERING THE PIT, OPEN THE PIT STOP SWITCH. BEFORE STEPPING INTO THE PIT, VISUALLY CHECK FOR EXCESSIVE GREASE OR OIL. PERFORM RISK ASSESSMENT; IF IT IS NECESSARY TO DEVIATE FROM THE ACE SAFETY ACCESS PROCEDURES OBTAIN SUPERVISOR APPROVAL BEFORE PROCEEDING.

Ensure all rollers are properly engaged by the cam.

Inspect switch rollers for wear and assure that wheels rotate freely. Lubricate roller bearings as necessary to eliminate squeaks and inspect for cracks. Verify that switches activate properly and that wiring connections are secure.

Clean & Inspect Hoistway

Before taking the car out of service notify proper building personnel and place “out of service” signs at all landings (as required).

NOTE: BEFORE MOVING THE CAR FAMILIARIZE YOURSELF WITH THE POSITION OF THE OTHER CARS IN THE VICINITY OF THE CAR BEING ACCESSED.

1. Run the car on inspection to a location below the highest landing to access the car top. Set up barricades as required.

WARNING PRIOR TO ENTERING THE HOISTWAY ALL ACE SAFETY POLICIES MUST BE FOLLOWED! BEFORE STEPPING ONTO THE CAR TOP VISUALLY CHECK FOR EXCESSIVE GREASE OR OIL.

2. From the car top move the car on inspection.
3. Clean dirt and trash from all horizontal surfaces.

4. Clean hoistway rails and brackets, door tracks and sills.
5. Use a dustpan and brush for large objects and a shop vacuum for the finish cleaning. Do not clean by blowing debris.
6. When cleaning and inspection of hoistway is complete, remove cleaning equipment, tools, and any debris from the car top. Restore car to normal operation. Run car on automatic up and down to check for proper operation.

Inspect & Lubricate Hoist Ropes

Hoist Ropes

1. If necessary, remove guards to perform the following hoist rope inspections, remove power first by using the standard Lock-Out/Tag-Out procedures. (See Field Safety Manual)
 - a. At the drive machine sheave, with the guards temporarily removed, check the hoist ropes for cracks or broken wires in the strands.

NOTE: IF CRACKS OR BROKEN WIRES ARE FOUND, COUNT THE NUMBER OF CRACKS OR BREAKS PER ROPE LAY (6-1/2 x DIAMETER) AND REPORT THIS OCCURRENCE TO YOUR SUPERVISOR.
 - b. Inspect the ropes for cleanliness (look for lint, dust, or excessive lubricant/grease build-up).
 - c. Check the ropes for signs of rust or excessive wear, and for signs of “flat spotting” or crown wear.
2. If guards were removed, replace guards using the standard Lock-Out/Tag-Out procedures restore power to system. (See Field Safety Handbook)
3. Check for a light film of oil in the drive sheave grooves; if no lubrication is present, lubricate the hoist ropes by running the car on inspection speed and applying lubricant with a paint roller as the wire ropes come past the sheave. Another option is to install a felt type lubricator on the bedplate or at the wire rope hole.

NOTE: LUBRICATION OF HOIST ROPES SHOULD BE DONE FOLLOWING THE MANUFACTURERS SPECIFICATION, USING ONLY APPROVED WIRE ROPE LUBRICATION.

NOTE: JOBS WITH EXTREME LEAD-OFF SHOULD BE GIVEN EXTRA ATTENTION TO THE HITCHES, ROPES & SHACKLES.

NOTE: CHECK GROOVE DEPTH TO GAUGE GROOVE WEAR.

WARNING PROIR TO ENTERING THE PIT OR HOISTWAY AREAS ALL ACE SAFETY POILICIES MUST BE FOLLOWED! BEFORE STEPPING INTO THE PIT OR ONTO THE CAR TOP , VISUALLY CHECK FOR EXCESSIVE GREASE OR OIL.

4. Starting from the top of the hoistway, run the car down on inspection speed stopping periodically (every other floor) to visually observe the wire ropes on the counterweight side for cleanliness and condition. Also inspect the governor rope as you go.
5. Inspect the ropes for cleanliness (look for lint, dust, or excessive lubricant/grease build-up).
6. Check the ropes for signs of rouge (rusting) or excessive wear, loss of rope diameter, signs of “flat spotting” caused by improper lubrication, age, or usage.
7. Report any signs of breaks, damage, excessive rouging or loss of rope diameter to your supervisor.
8. Check rope tension and adjustment as described in Service Manual.
9. Check the rope data tags to see that they are properly fastened at the shackles on the car top hitch plate.

Car & Counterweight Buffers

WARNING BEFORE ENTERING THE PIT, OPEN THE PIT STOP SWITCH. BEFORE STEPPING INTO THE PIT, VISUALLY CHECK FOR EXCESSIVE GREASE OR OIL. PERFORM RISK ASSESSMENT; IF IT IS NECESSARY TO DEVIATE FROM THE ACE SAFETY ACCESS PROCEDURES, OBTAIN SUPERVISOR APPROVAL BEFORE PROCEEDING.

1. Follow proper access/egress measures.
2. Verify pit stop switch functions properly. Go to pit area, set barricades as required at the bottom landing. Run the elevator up above the bottom landing to give clear access to the pit. Secure the elevator using standard Lock-Out/Tag-Out procedures. (See Field Safety Handbook)
3. Check for adequate lighting and for any water in the pit. If water in pit is detected, notify your supervisor.
4. Check buffer oil level, ensure piston is free of rust or dirt.
5. Check structural integrity of the pit channels.
6. Check for loose or missing bolts.
7. If inspection of the counterweight or car buffer requires the use of fall protection, follow the procedures found in the Field Safety Handbook.

Compensation Ropes/Chains/Sheaves

Before taking the car out of service notify proper building personnel and place “out of service” signs at all landings (as required).

WARNING BEFORE ENTERING THE PIT, OPEN THE PIT STOP SWITCH. BEFORE STEPPING INTO THE PIT, VISUALLY CHECK FOR EXCESSIVE GREASE OR OIL. PERFORM RISK ASSESSMENT; IF IT IS NECESSARY TO DEVIATE FROM THE ACE SAFETY ACCESS PROCEDURES, OBTAIN SUPERVISOR APPROVAL BEFORE PROCEEDING.

1. Inspect compensation sheaves for wear. Use a groove gauge as needed to ensure that ropes or chains move freely and that pull offs are correct. Confirm compensation sheave switch is set or mounted in proper location to prevent compensation sheave from bottoming out. If compensation sheave is near to bottoming out, report this to supervisor.
2. Inspect and lubricate sheave bearings when applicable.
3. Inspect ropes or chains for wear and proper spring tensioning. If applicable, check jacket for cracking. Report any cracked conditions for proper resolution.
4. Inspect attachment points to both car sling and counterweights.
5. Inspect compensation sheave tie downs (on units above 700 ft. pm) for proper operation and adjustments as necessary.

Governor Tail Sheaves/Clearances

Before taking the car out of service notify proper building personnel and place “out of service” signs at all landings (as required).

WARNING BEFORE ENTERING THE PIT, OPEN THE PIT STOP SWITCH. BEFORE STEPPING INTO THE PIT, VISUALLY CHECK FOR EXCESSIVE GREASE OR OIL. PERFORM RISK ASSESSMENT; IF IT IS NECESSARY TO DEVIATE FROM THE ACESAFETY ACCESS PROCEDURES, OBTAIN SUPERVISOR APPROVAL BEFORE PROCEEDING.

Refer to OEM product manual for tolerances, maintenance procedures, and adjustment instructions of the governor tail sheave.

1. Inspect and lubricate tail sheave. When applicable, ensure proper guarding is in place.
2. Verify sheave clearance allows for weight on governor rope and is free to self-adjust as the rope stretches.
3. Inspect governor rope for wear.

WARNING AT NO TIME SHALL THE GOVERNOR WIRE ROPE BE LUBRICATED.

Door Close Kinetic Energy

Kinetic Energy Test (Full Speed)

NOTE: KINETIC ENERGY CAN BE TESTING USING THE TIMING METHOD BASED ON LOCAL CODE REQUIREMENTS.

Door Gauge Method

1. Place an obstruction in the doorway so that the door(s) will stop and reopen at least 12" from fully closed, but will have room to strike the gauge prior to the obstruction.
2. Push the O-ring on the gauge against the large end of the tube.
3. Open the doors electrically and place one end of the gauge against the jamb (or leading edge of one of the doors on center-opening), aligned so that the leading edge of the moving door will strike the gauge.
4. With the gauge in position, allow the doors to strike the kinetic energy gauge at high speed.
5. Remove the gauge and determine the kinetic energy based on the position of the O-ring as follows.
 - a. Locate the kinetic energy line that corresponds to the previously noted torque reading (27ft lbf on horizontal line).
 - b. Follow torque line until it intersects with the O-ring.
 - c. Follow the intersecting sloped line and read the kinetic energy scale (4.6 ft lb).
6. Verify that the door kinetic force does not exceed the local code requirements.

Door Timing Method

1. Measure the door opening from jamb to jamb.
2. Determine the minimum Code door closing time from tables 1, 2, or 3 based on the type of doors.
 - a. Single speed, two speed
 - b. Center opening
 - c. Door material (standard or stainless)
3. For single speed or two speed doors, mark the sill 2" from each jamb.
4. For center opening doors mark the sill 1" from jamb and 1" from center point.
5. Time the doors on closing from one mark to the other.
6. Verify the times are greater than or equal to the minimum door closing time tables 1,2, or 3

NOTE: TABLE INFORMAITON IS BASED ON ALL CODE DISTANCES PER ASME A17.1 RULE 112.4.

- Average closing speed in feet per second, is the code distance (in feet) divided by the closing time (in seconds).
- 7 ft lbf maximum allowable kinetic energy (full speed)
- 2.5 lb lbf maximum allowable kinetic energy (nudging speed)
- 7.5 lb sq ft for standard doors
- 8.5 lb sq ft for stainless doors
- 60 lbs hardware on single-speed door
- 112 lbs hardware on two-speed doors

- 100 lbs hardware on center opening doors
- ¼ ft lbf kinetic energy allowed for door operator
- 7 ft door heights

Kinetic Energy Test (Nudging Duty)

Door Timing Method

1. Measure the door opening from jamb to jamb
2. Determine the minimum Code door closing time for tables 1,2, or 3 based on the type of doors
 - a. Single speed, two speed
 - b. Center opening
 - a. Door material (standard or stainless)
3. For single speed or two speed doors, mark the sill 2" from each jamb.
4. For center opening doors mark the sill 1" from jamb and 1" from center point.
5. Enable Nudging operation if available
6. Reduce the Nudging Timer value to 15 seconds (if available)
7. Increase the Watchdog Fail Timer value (if available) to 100 seconds (maximum)
8. Open the door(s) and prevent them from closing with the safety edge until Nudging activates.
9. When Nudging operation starts, time the doors on closing from one mark to another
10. Verify the times are greater than or equal to the minimum door closing time tables 1,2, or 3

NOTE: TABLE INFORMATION IS BASED ON ALL CODE DISTANCES PER ASME A17.1 RULE 112.4.

- Average closing speed in feet per second, is the code distance (in feet) divided by the closing time (in seconds).
- 7 ft lbf maximum allowable kinetic energy (full speed)
- 2.5 lb lbf maximum allowable kinetic energy (nudging speed)
- 7.5 lb sq ft for standard doors
- 8.5 lb sq ft for stainless doors
- 60 lbs hardware on single-speed door
- 112 lbs hardware on two-speed doors
- 100 lbs hardware on center opening doors
- ¼ ft lbf kinetic energy allowed for door operator
- 7 ft door heights

Door Time Data

				Minimum Door Closing Time (in Seconds)	
		Standard		Stainless	
Door Opening (inches)	Timed Code Distance (inches)	Full Speed	Nudging Speed	Full Speed	Nudging Speed
24	20	1.32	2.20	1.38	2.30
26	22	1.49	2.49	1.57	2.62
28	24	1.68	2.81	1.76	2.94
30	26	1.87	3.12	1.97	3.29
32	28	2.07	3.46	2.18	3.64
34	30	2.27	3.79	2.39	3.99
36	32	2.48	4.14	2.62	4.37
38	34	2.70	4.51	2.84	4.74
40	36	2.92	4.88	3.08	5.14
42	38	3.15	5.26	3.32	5.54
44	40	3.38	5.64	3.57	5.96
46	42	3.61	6.03	3.82	5.38
48	44	3.86	6.45	4.08	6.81

Table 1: Door Time Data Single Speed Doors

				Minimum Door Closing Time (in Seconds)	
		Standard		Stainless	
Door Opening (inches)	Timed Code Distance (inches)	Full Speed	Nudging Speed	Full Speed	Nudging Speed
36	32	2.09	3.49	2.19	3.66
38	34	2.27	3.79	2.38	3.97
40	36	2.45	4.09	2.57	4.29
42	38	2.63	4.39	2.76	4.61
44	40	2.82	4.71	2.96	4.94
46	42	3.02	5.04	3.17	5.29
48	44	3.21	5.36	3.38	5.64
50	46	3.41	5.69	3.59	5.99
52	48	3.62	6.04	3.81	6.36
54	50	3.83	6.40	4.02	6.71
56	52	4.04	6.75	4.25	7.10
58	54	4.25	7.10	4.48	7.48
60	56	4.47	4.76	4.71	7.87
62	58	4.70	7.85	4.95	8.27
64	60	4.92	8.22	5.19	8.67
66	62	5.15	8.60	5.43	9.07

Table 2: Door Time Data – Two Speed Doors

				Minimum Door Closing Time (in Seconds)	
		Standard		Stainless	
Door Opening (inches)	Timed Code Distance (inches)	Full Speed	Nudging Speed	Full Speed	Nudging Speed
36	16	1.31	2.19	1.37	2.29
38	17	1.42	2.37	1.49	2.49
40	18	1.53	2.55	1.61	2.69
42	19	1.65	2.76	1.73	2.89
44	20	1.76	2.94	1.85	3.09
46	21	1.88	3.14	1.98	3.31
48	22	2.01	3.36	2.11	3.52
50	23	2.13	3.56	2.25	3.76
52	24	2.26	3.77	2.38	3.97
54	25	2.39	3.99	2.52	4.21
56	26	2.53	4.22	2.66	4.44
58	27	2.66	4.44	2.81	4.69
60	28	2.80	4.68	2.95	4.93
62	29	2.94	4.91	3.10	5.18
64	30	3.09	5.16	3.25	5.43
66	31	3.23	5.39	3.41	5.69

Table 3: Door Time Data – Center Opening Doors

Section 1-3

Traction Tests

Category One (1) Category Five (5)

Periodic Testing & Witnessed Testing Conforms to ASME A17.1

Current Code Adopted by the State of Minnesota.

Traction

Category One (1) Test

NOTE: PROPER COMMUNICATION IS THE KEY TO PERFORMING AN ANNUAL OR 5 YEAR FULL LOAD TEST SAFELY. DO NOT PROCEED ANY STEP OF THE TEST WITHOUT CONFIRMATION AS NEEDED.

NOTE: FOLLOW ALL ACE SAFETY POLICIES WHEN DOING THE TEST

1. Arrive at the job, check in with the proper building personnel and explain the testing process.
2. Capture the elevator and place "out of service" signs at each landing (as required). Place elevator on car top inspection.
3. Operate car governor manually to determine that all parts operate freely.
4. Repeat previous steps for counterweight governor (if applicable).
5. Reset the governor
6. Run elevator on inspection up and down the hoistway to be sure that the governor is reset properly and the safeties do not set.
7. Reinstall all guards and covers on the governor.
8. Go to pit area. Set up barricades at the bottom landing. Run the elevator up and above the bottom landing to give clear access to the pit. Secure the elevator using the standard Lock-Out/Tag-Out procedures.

WARNING BEFORE ENTERING THE PIT, OPEN THE PIT STOP SWITCH. BEFORE STEPPING INTO THE PIT, VISUALLY CHECK FOR EXCESSIVE GREASE OR OIL. PERFORM RISK ASSESSMENT; IF IT IS NECESSARY TO DEVIATE FROM THE ACE SAFETY ACCESS PROCEDURES, OBTAIN SUPERVISOR APPROVAL BEFORE PROCEEDING.

9. After entering the pit, check all buffers to ensure they have the proper fluid level. If not, replenish. Visually inspect the safeties to ensure proper operating condition.
10. Exit pit area using proper pit egress procedures.
11. Next, visually inspect the limit actuating device(s) as well as the alignment of the limit devices themselves to ensure proper engagement. The actuating device should be of sufficient length and the limit devices adjusted so that they will stay activated from the point of contact through the physical limits of car motion (buffer fully compressed)

NOTE: SOME NORMAL LIMIT DEVICES ARE LOCATED ON THE SELECTOR SYSTEM.

12. With the car on inspection, move the car up and down until the normal direction limit is engaged and the car comes to a stop. The direction should be reversed and the car allowed to travel a short distance to ensure that the final limit device has not been operated at the same time as the normal limit.
13. Bypass the normal limit device and run the car onto final limit. The car should stop and the safety circuit should open. If spring buffers are involved make sure that the final limit operates and stops the car before contacting the buffer.
14. Once the safety circuit is opened, it should be bypassed and the car moved in the opposite direction until there is sufficient distance to allow the limit devices to deactivate then remove bypass device(s).
15. Go back to the machine room. Make sure the car is on inspection at the controller and the doors are disabled and fully closed.
16. Run the elevator down on inspection and at an appropriate location in the hoistway, trip the car governor by hand. Verify that the safeties bring the car to an abrupt stop.
17. Bypass the safety plank (SOS) switch.
18. Before moving the car up to reset the car governor, look in the hoistway to verify that nothing was damaged.
19. Bump the car up to reset the governor.
20. Enter the pit. Set up barricades at the bottom landing. Run the elevator up and above the bottom landing to give clear access to the pit. Secure the elevator using the standard Lock-Out/Tag-Out procedures.

WARNING BEFORE ENTERING THE PIT, OPEN THE PIT STOP SWITCH. BEFORE STEPPING INTO THE PIT, VISUALLY CHECK FOR EXCESSIVE GREASE OR OIL. PERFORM RISK ASSESSMENT; IF IT IS NECESSARY TO DEVIATE FROM THE ACE SAFETY ACCESS PROCEDURES, OBTAIN SUPERVISOR APPROVAL BEFORE PROCEEDING.

21. Establish commutation to verify all persons are in a safe location in the pit. Run the car down on inspection to a location so the SOS switch may be reset. Turn the mainline disconnect off. The person in the pit will reset the safety plank switch. Remove the SOS bypass device from the controller.
22. Notify the person in the pit the mainline disconnect is being turned ON. At the car controller, verify the safety circuit is good.
23. Run the car up on inspection. Exit pit area using proper pit egress procedures.
24. For counterweight safeties (if applicable), run the elevator up on inspection to an appropriate location in the hoistway and trip the counterweight governor by hand. Verify that the safeties bring the car to a prompt stop and that the counterweight governor switch opened the safety circuit.
25. Bypass the counterweight governor safety switch.
26. Before moving the car down to reset the counterweight governor, look in the hoistway to verify that nothing was damaged.
27. Bump the car down to reset the counterweight governor and counterweight governor switch.
28. Remove previously installed counterweight governor safety switch bypass device.

CAUTION PRIOR TO PERFORMING BUFFER TEST ENSURE THAT THERE IS SUFFICIENT OVERHEAD CLEARANCE FOR BOTH CAR AND COUNTERWEIGHT.

29. Bypass the normal, final, and buffer switch as needed to run the car down on inspection speed and compress the car buffer.
30. Run the car up on inspection to provide enough clearance for the buffer to return, remove bypass means, and verify that the car buffer returns to the normal position and reset the buffer switch (if applicable).

NOTE: IF THE BUFFER(S) DO NOT RETURN TO NORMAL POSITION, IDENTIFY THE PROBLEM AND NOTIFY YOUR SUPERVISOR.

31. Bypass the normal, final and buffer switches as needed to run the car up on inspection speed and compress the counterweight buffer.
32. Run the car down on inspection to provide enough clearance for counterweight buffer return, remove bypass means and verify that the car buffer has returned.

NOTE: IF THE BUFFER(S) DO NOT RETURN TO NORMAL POSITION, IDENTIFY THE PROBLEM AND NOTIFY YOUR SUPERVISOR.

33. Run the car up to the top floor and place on car top inspection. Run down through the hoistway checking all interlocks, door restrictors, car stop switch, and gate switch. Also check the broken rope switch, tape switch, or chain switch, (whichever is applicable).

WARNING BEFORE ENTERING THE HOISTWAY OR PIT AREAS ALL ACE SAFETY POLICIES MUST BE FOLLOWED! BEFORE STEPPING ONO THE CAR TOP OR INTO THE PIT, VISUALLY CHECK FOR EXCESSIVE GREASE OR OIL.

34. After the hoistway is inspected, exit the car top. Go to the machine room to verify that all bypass devices have been removed.
35. Place the car on independent service and run the elevator from top to bottom several times to make sure it is safe to return it to automatic operation.
36. Perform Fire Service Operation Test procedure, both Phase 1 & Phase II operations (if required)
37. After the fire service operation test is complete, return the elevator to normal operation. Ride again to verify normal operation.
38. Install data tags as required by code.
39. Notify the proper building personnel that testing is complete, and put the car back in service.
40. Update "Maintenance Check Chart" log.

Ascending Car Overspeed Protection and Unintended Car Motion Device

1. Refer to the manufacturer's guidelines for instructions on how to operate the overspeed protection and unintended car motion device.
 - a. Ascending Car Overspeed Device:
 - i. Using the tachometer, verify that the device will actuate less than 10% above the car governor's tripping speed.
 - ii. Verify that the device is in the braking position when the power is removed.
 - iii. Verify that the emergency braking device, when activated, can only be reset manually.
 - b. Protection against Unintended Car Motion Device:
 - i. Verify that the device will actuate when outside the door zone if hoistway door and car gate are perceived as open.
 - ii. Verify that the device is in the braking position when the power is removed
 - iii. Verify that the emergency braking device, when activated, can only be reset manually.

Standby Emergency Power Operation

NOTE: PERFORMING THIS PROCEDURE IS A COORDINATED EFFORT BETWEEN THE ELEVATOR MAINTENANCE PERSONNEL AND THE BUILDINGS DESIGNATED EMERGENCY POWER TESTING TEAM.

1. The Emergency Power Testing Team will assign a time slot for the elevator test.
2. Once the elevators are on Emergency Power Operation, performance testing of landing accuracy and proper operation will be observed.
3. With no load in the car, each elevator will be speed tested with a tachometer to verify the elevator is running at contract speed, paying special attention to the up direction and that no elevator is running above 125% of contract speed.
4. Notify the Emergency Power Testing Team that emergency testing is complete.

Power Operation of Door System

Refer to "Door Closer Force" and "Door Close Kinetic Energy" for instruction on performing this test.

Slack Rope Devices on Winding Drum Machines

1. For winding drum machines (freight only):
 - a. Ensure all doors and gates are closed and locked.
 - b. Manually run the car in the up direction
 - c. Using a wooden rod or dowel; manually trip the slack rope device.
 - d. Observe the car stops and the slack-rope device remains in the tripped position until manually reset.

Traction

Category Five (5) Test

NOTE: PROPER COMMUNICATION IS THE KEY TO PERFORMING AN ANNUAL OR 5 YEAR FULL LOAD TEST SAFELY. DO NOT PROCEED ANY STEP OF THE TEST WITHOUT CONFIRMATION AS NEEDED.

NOTE: FOLLOW ALL ACE SAFETY POLICIES WHEN DOING THE TEST

1. Before going to the job, verify the capacities of all elevators to be sure enough weights are taken to complete the job. Discuss the testing plan specific to the particular building conditions.
2. Arrive at the job, check in with the building personnel, and explain the testing process.
3. Unload the weights and stage them in an appropriate location.
4. Capture the elevator and place "out of service" signs at each landing (as required). Place the elevator on car top inspection.
5. Prepare for the pull-through test, establish good radio communication between all persons performing the testing procedure.
6. Remove all guard on the car governor in the machine room and set the jaws.
7. Perform the pull-through test.
8. After pull-through test is verified, remove all rigging and reset the jaws.
9. Repeat steps 6-8 for the counterweight governor (if applicable).
10. Run the elevator on inspection up and down the hoistway to be sure that the governors reset properly and the safeties do not reset.
11. With the car at the top floor, use a chain hoist (comealong) and a rope clamp to pull slack from the car governor rope on the tail sheave side. The mechanic should verify that there is enough slack to remove the rope from the car governor sheave.

WARNING VICE GRIPES MAY BE USED TO HOLD THE GOVERNOR ROPE OUT OF THE WAY BUT IT SHOULD NOT BE USED TO SUPPORT THE WEIGHT OF THE ROPE AND TAIL SHEAVE. THE USE OF VICE GRIPES IN THIS APPLICATION CAN RESULT IN PERSONAL INJURY OR DAMAGE TO THE GOVERNOR ROPE.

12. Remove the car governor rope from the sheave and tie back as necessary.
13. Turn OFF the mainline disconnect and disable the car using the standard Lock-Out/Tag-Out procedure. See Field Safety Handbook.
14. Have the apprentice come to the machine room to hold the tachometer on the governor sheave while the mechanics spins the car governor.
15. Verify the car governor is properly adjusted for contract tripping speeds, both switch and jaws. If not recalibrate and seal.
16. Put the governor cable back on the sheave. Using standard Lock-Out/Tag-Out procedures, turn machine disconnect power back ON. (See Field Safety Handbook)
17. Have the apprentice go to the car top, running the elevator down on inspection just far enough to tighten the car governor rope. Once completed remove the vice grips.
18. Reinstall all guards and covers on car governor.

19. Repeat steps 11-18 for counterweight governor (if applicable).
20. Run elevator up and down the hoistway on inspection speed to make sure the governors do not drag or set. Also make sure the safeties are not dragging.
21. Go to pit area, set barricades at bottom landing (as required). Run the elevator up above the bottom landing to give clear access to the pit. Secure the elevator using standard Lock-Out/Tag-Out procedures. (See Field Safety Handbook)

WARNING BEFORE ENTERING THE PIT, OPEN THE PIT STOP SWITCH. BEFORE STEPPING INTO THE PIT, VISUALLY CHECK FOR EXCESSIVE GREASE OR OIL. PERFORM RISK ASSESSMENT; IF IT IS NECESSARY TO DEVIATE FROM THE ACE SAFETY ACCESS PROCEDURES, OBTAIN SUPERVISOR APPROVAL BEFORE PROCEEDING.

22. After entering the pit, check all buffers to ensure they have the correct fluid levels. If not, replenish. Visually inspect safeties to ensure proper operating condition.
23. Exit pit area using proper pit egress procedures.
24. Go back to the machine room, make sure the car is on independent at the controller and the doors are disabled and fully closed.
25. Run the elevator on independent service from the machine room to tach the car speed. This is to make sure the elevator is running at contract speed (deviation of +/- 5% allowed).
26. Verify that power operated doors only function within the specified door zone.
27. Check directional limits from the machine room on independent operation. Verify directional limits and final limits are working properly. If the Normal Terminal Slowdown (NTS) and the Emergency Terminal Slowdown (ETS) mechanical switches, verify they are working properly.
28. Return car to independent service and test:
 - a. NTS devices – Check the bottom and top NTS devices at contract speed.
 - b. ETS devices (if applicable) – Override the normal terminal slow down devices. Check the bottom and top ETS devices at contract speed.

WARNING WHEN TESTING THE ETS DEVICES ALWAYS TEST THE BOTTOM ETS DEVICE FIRST. FOLLOWING THE MANUFACTURERS GUIDELINES. THE NTS DEVICE IS OVERRIDEN WHILE THE ETS DEVICE IS BEING TESTED. IF THE ETS SYSTEM FAILS DURING TEST, THE EQUIPMENT COUD BE SIGNIFICANTLY DAMAGED.

29. Verify that the leveling zone does not exceed the maximum distance allowed by code Verify that the leveling speed does not exceed 150 FPM. Ensure that leveling speed does not exceed 150 FPM with the doors open, and that the speed limiting device is independent of the normal control means according to the manufacturer's code required guidelines.
30. Load weights in the elevator cab. Install enough weights in the car (at bottom landing) to meet 100% capacity.

WARNING CAR MAY RELEVEL WHILE MOVING WEIGHTS.

31. Run the car up to the next landing and install enough weights to equal 125% of a full load
32. Close the doors. From the machine room, run the car down to the bottom landing on independent service with the doors disabled and verify the elevator makes a normal stop.
33. Mainline disconnect must now be placed in the OFF position to ensure that the load is not being held electrically by the motor. Verify the brake holds the load. If not, adjust the brake at this time. After verification, turn mainline disconnect back on.
34. The following procedure will provide steps for the Emergency Stopping Distance test:
 - a. Remove 25% of the weights at the bottom landing. Center the rest of the weights in the car.
 - b. If the car has counterweight safeties, securely tie off the counterweight safety lift arm to prevent the counterweight safeties from setting during the test (i.e. Four (4) wraps of 16 WGS copper wire).
 - c. Run the car to an upper landing that will allow the car to reach contract speed in the down direction before reaching bottom terminal.

- d. Removed 25% remaining weights from the car.
- e. Return the bottom terminal and retrieve the previously removed weights back onto the car.
- f. Return to the upper landing and reload weights previously removed at that landing. Ensure the car now has 125% of the full load.
- g. Verify doors are closed.
- h. Set up a bottom floor car call with the elevator on independent service.
- i. When the elevator reaches contract speed, open the safety circuit.
- j. Observe that the car stops and holds 125% load.
- k. Remove 25% of weights at bottom landing. Center the rest of the weight in the car.

NOTE: THE WEIGHTS ARE CENTERED TO BE SURE THE CAR DOES NOT GET RACKED DURING THE FULL-LOAD SAFETY TEST.

35. Run the car on independent operation and tach the car with a full load.

NOTE: IF COUNTERWEIGHT SAFETIES ARE PRESENT, ENSURE THAT THE COUNTERWEIGHT SAFETIES ARE STILL TIED.

36. Run the elevator to the top landing.

37. Verify the doors are closed.

38. Set up a bottom floor car call with the elevator on independent service.

39. When the elevator reaches contract speed, trip the car governor to set the safeties. Ensure the car comes to a complete stop.

40. Place the elevator on machine room inspection. Install jumper/bypass device to jump out the safety plank (SOS) switch.

41. Before moving the car up to reset the governor, measure the safety slide code compliance.

42. Bring the car up to reset the car governor. Measure the safety slide for code compliance.

43. Enter the pit again, following safety protocol.

44. Establish communication to verify all persons are in safe location in the pit. Run the car down on inspection.

45. When the elevator is at the proper height, turn the mainline disconnect OFF. The person in the pit will reset the safety plank switch. Remove the SOS jumper/bypass device from the controller.

46. Warn the person in the pit that the mainline disconnect is being turned back ON. At the car controller, verify the safety circuit is good.

47. Run the car up on inspection. The person in the pit shall safely exit.

NOTE: THE NEXT STEP IS A FULL SPEED BUFFER TEST. ONLY THE CAR BUFFERS ARE TESTED WITH A FULL LOAD.

48. Confirm there are no persons in the pit.

49. Prior to performing the buffer test ensure that there is sufficient overhead clearance for both the car and the counterweight.

50. Run the car down on full speed to hit the buffers. Remember different controller types require a different means of doing the jumper/bypass device, computers, etc.

51. Place the car on inspection from the machine room. Place a jumper on the final limits and run the car up. Remove jumper, verify safety circuit stays up. Look into the pit and make sure the buffers returned to normal position and reset buffer switches (if applicable).

NOTE: IF THE BUFFER(S) DO NOT RETURN TO NORMAL POSITION, IDENTIFY THE ISSUE AND CALL YOUR SUPERVISOR.

52. Run the car to the bottom landing and remove the weights.

53. After the weights are removed, close the doors and run the car to the landing one floor down from the top.

54. Run the car full speed up into the overhead to perform the counterweight buffer test.

55. Using the manufacture's guidelines securely tie off the car safety lift arm before the counterweight buffer test. Depending on the location of the lift arm this should be done with the mainline OFF.

56. After the counterweight buffer test place the elevator on inspection from the machine room, jump out the limit switches, run the car down, remove the jumper and verify the safety circuit stays up.

57. Go to the pit area and make sure the counterweight buffer returned to the normal position and reset buffer switches (if applicable).

NOTE: IF THE COUNTERWEIGHT BUFFER DOES NOT RETURN TO NORMAL POSITION IDENTIFY THE ISSUE AND CALL YOUR SUPERVISOR.

58. If counterweight safeties are applicable, perform the counterweight safety test:
 - a. Run the elevator to the bottom landing.
 - b. Verify the doors are closed.
 - c. Set up a top floor car call with the elevator on independent service.
 - d. When the elevator reaches contract speed trip the counterweight governor to set the counterweight safeties.
 - e. Before moving the car down to reset the counterweight governor, look in the hoistway to be sure nothing was damaged.
 - f. Bump the car down the reset the counterweight governor. Measure the counterweight safety slide for code compliance.
59. Remove the tie off rigging from the car safeties. This is done with the mainline disconnect turned OFF.
60. Restore mainline power. Run the car up to the top floor and place on car top inspection. Run the car down through the hoistway checking all interlocks, door restrictors, car top switches, and gate switch.
61. After the hoistway has been inspected, exit the car top. Go back to the machine room and verify that all bypass devices have been removed.
62. Place the car on independent service and run the elevator from top to bottom several trips to make sure the car is safe to run on automatic operation.
63. Install data tags as required by code.
64. Notify the proper building personnel the test is complete and put the car back in service.
65. Update "preventative maintenance book" log in the machine room.

NOTE: THE FOLLOWING EQUIPMENT EXISTS ON THE INSTALLTION BEING TESTED, THAT EQUIPMENT MUST BE TESTED AS NOTED BELOW.

Emergency & Standby Power Operation.

NOTE: PERFORMING THIS PROCEDURE IS A COORDINATED EFFORT BETWEEN THE ELEVATOR MAINENANCE PERSONNEL AND THE BUILDINGS DESIGNATED EMERGECCNY POWER TESTING TEAM.

1. The emergency power testing team will assign a time slot for the elevator test.
2. Load weights into the elevator cab. Install enough weight in the car (at bottom landing) to meet 100% capacity.
3. Speed test each elevator with a tachometer to verify the elevator is running at contract speed. Paying special attention to the up direction and that no elevator is running above 125% of contract speed.

WARNING CAR MAY RELEVEL WHILE MOVING WEIGHTS.

NOTE: IF THE CAR HAS TYPE "A" SAFETIES, TAKE CARE NOT TO COVER THE CRANK ACCESS PLATE.

4. Notify the emergency power testing team that the emergency testing is completed.

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