



Department of Veterans Affairs – Office of Construction & Facilities Management

CONSULTING SUPPORT SERVICE (003C5)

Technical Topics

Elevator Pretest Procedures

April 5, 2013

A. Traction or Hydraulic Elevators:

1. These guidelines are presented in an effort to prevent waste of time and money in the final testing of elevators. This procedure is intended to determine if an elevator is ready for final inspection. Of all the deficiencies usually found during inspection, only a few result in aborting the test.
2. CAUTION: Testing a newly installed elevator can be quite dangerous. Without previous experience in testing elevators, the chance of serious injury increases. WE STRONGLY URGE YOU TO STAY OUT OF THE HOISTWAY. Any observations or measurements described in this procedure can be accomplished from outside the hoistway, with the assistance of the elevator mechanic. Have the elevator mechanic verify that the safety circuit is operating properly. The hoistway door interlocks, car gate switch, final runby limit switches, all stop switches, and the car top emergency exit switch when open, shall stop the elevator and prevent it from running until the switches are closed.
3. Observe all hall lanterns, hall and car position indicators, and hall push buttons for proper operation. Check for car floor leveling to be within 1/8 inch at empty and full capacity loads. All elevators must have a working car communications system. The system shall be an ADA hands free telephone system. Elevators must also have Phase 1 and Phase 2 fire service and smoke detector systems. Communication and fire services are code items and shall function as per National Elevator Code ASME A17.1. Elevators cannot be accepted with code violations.
4. When testing in the machine room, be especially aware of rotating equipment such as the hydraulic pump and pump motor. This belt drive combination can start at any time for reasons other than floor to floor travel. On a traction elevator, the hazard is the drive sheave and cables. Constant awareness is needed when a traction elevator is being tested

for correct speeds. Further hazards are the obvious dangers of tripping, falling, and electrical shock.

B. Hydraulic Elevators:

1. Through the bottom hoistway door observe that the automatic shutoff valve has been installed as close as possible to the head of the jack assembly. Do not use victaulic fittings between the jack and the shutoff valve.
2. Verify that all piping and fittings are of specified size before further testing. (Entire system rated for twice the working pressure.) This verification should be provided to you by the elevator contractor.
3. To test the automatic shutoff valve, place rated capacity on the elevator. Request a terminal-to-terminal run, after which you direct the elevator mechanic to cause the automatic shutoff valve to be activated. This can usually be observed through the bottom hoistway door when the door lock is bypassed by the elevator mechanic. Activation shall be caused by either overloading or overspeeding, or a combination of both. Under no circumstance is the mechanic to enter the pit from the start of the terminal runs until the completion of the test. After successful activation of the automatic shutoff valve, have the mechanic run the elevator up to reset the valve. Remove the overloading or overspeeding condition and make three terminal-to-terminal runs again. **BE SURE TO REMIND THE MECHANIC TO REMOVE ANY CIRCUIT BYPASS DEVICE USED DURING THE TEST.** It should be emphasized that **NO ONE IS TO ENTER THE PIT FROM THE LOADING OF THE WEIGHTS TO THE COMPLETION OF THE TEST.** Adjustment of the automatic shutoff valve for any reason during the test nullifies the test, and it must be started again.
4. Amperage of the pump motor shall be checked with an ammeter or amprobe, preferably in the controller. The reading should be taken on up runs with full capacity on the elevator. A reading of more than 10% of the motor's own amperage rating, as stamped on the data tag, indicates that the motor size is not sufficient and should be replaced.
5. A point of information regarding the pump motor size. Experience has shown that a horsepower rating of between 40 and 60 has been needed for successful operation of our standard elevators rated at 4,000 or 5,000 lbs. capacity. Rarely, if at all, has a 30 horsepower motor proved to be adequate.

6. To test the pressure, first determine that the gauge is placed in the machine room where it is reading pump pressure to the jack assembly. With full capacity on the elevator, the pressure must not exceed 500 PSI on an up run.
7. Observe that all specified devices, such as muffler, shutoff valves and gate valves are installed at the time the unit is tested. Any additions made to the hydraulic pipe run usually cause an increase to both the working pressure and pump motor amperage. If any changes have to be made to the pipe run, the amperage and pressure readings should not be recorded until changes are completed.
8. Conduct a one-hour performance test. With rated capacity on the car, take temperature readings of the pump motor, the hydraulic oil and the machine room. Start the one-hour test. The doors shall operate at every stop at each floor. Floor accuracy of plus or minus 1/8 inch shall be observed at the start of the test, as well as the completion. If the elevator is unable to run for one hour without repairs or adjustments, then it is not ready for final inspection. Reason dictates that a one-time shutdown, with a simple solution, should not abort this pretest. However, repeated shutdown of any nature indicates that the elevator is not ready for final testing.
9. At the end of the one-hour performance test, the elevator should still be stopping level in both directions, without releveling operations. Obvious changes in floor levels or harshness of starting or stopping indicate major problems. Also, temperature rise in excess of nameplate ratings indicates that the final test should be aborted.

C. Electric Traction Elevators:

1. Check the amperage in the controller with an ammeter or amprobe. The readings shall be taken in both directions with empty car and full load. Readings of more than 5% over data tag number located on SCR DRIVE or VVVF/AC DRIVE the data tag located on the machine, indicates possible motor problems and is not acceptable.
2. Check the car safeties. After taching the speed governor or being assured that it has been tached and properly set, request a demonstration of the elevator safeties. This may be done with an empty car. The elevator shall be run at inspection speed in the down direction to the point where the speed governor, when manually tripped will activate the car safeties,

and the car safeties will wedge themselves on the guide rails. The governor shall be activated by the elevator mechanic.

3. Conduct a one-hour performance test. After loading the elevator to capacity, record the machine room temperature, and the temperature of the hoist motor. Run the one-hour performance test in the manner similar to the description under hydraulic elevators. At completion, look for noticeable changes in smoothness of starting and stopping, and accuracy of the floor stops. Check for "roll back" when brake is lifted. Failure in these areas and/or repeated shutdowns indicates the elevator is not ready for final inspection.
4. To conduct the buffer tests, have the car and counterweights strike the buffers with an empty load on the car. These tests are to be done at inspection speed. Following each test, observe that the buffer has returned to the original height within 90 seconds. Also check that excessive oil leakage did not occur. A slight spray is acceptable.
5. During the buffer test, excessive oil leakage would be indicated by oil sprayed on pit walls and floor, or seen dripping from elevator car frame following the striking of the buffers. Either condition would require necessary repairs or replacement of buffers before a final test should be scheduled.

D. Other Recommendations:

1. Any parts or items that have to be replaced because of failure during pretesting, that would change the hydraulic or electrical system, would have to be pretested before the final testing is scheduled.
2. For more information, contact the Consulting Support Service (003C5), Bill Haupt at 202-632-5117, or Brian Phillips at 202-632-5446.