

State of Ohio Guidelines

For performing Test on Underground Cylinders

Standard Operating Procedures for investigating and testing possible of an underground hydraulic cylinder:

When testing cylinders for underground leaks, follow the guidelines in ASME A17.1 8.11.2.2 and ASME A17.2 inspector's manual.

NOTE: Per State of Ohio Elevator Inspection policy, the car shall sit a minimum of 24 hours at the top landing with a full load.

ASME A17.2.2 Item 2.2.3 UNDERGROUND CYLINDER LEAK TEST (Item 8.11.2.2)

- 1.) Note the amount of oil in the pit seal leak collection container.
- 2.) Park the elevator at top level with a full load on the car and open the main line disconnects.¹
- 3.) Mark the level of oil in the tank
- 4.) Wait at least 24 hours and measure the amount that the car has moved down
- 5.) Compute the volume of oil loss as a result of the car movement as follows.

$$V=3.1416 \times R^2 \times L$$

Where

V=volume of oil in cubic inches

R=radius of plunger (in)

L=movement of car (in)

- 6.) Compare this to the change in volume in the pit seal leak collection container and the tank.

Example: L=7", Plunger diameter = 6"

$$V= 3.146 \times 9 \times 7 = 198 \text{ in}^3$$

If the tank is 18" by 36" the level would be raised approximately 5/16"

$$198 \text{ divided by } 18 \times 36 = 0.305$$

- 7.) If necessary, continue the test to verify the source of the leak.

If it is determined that a leak exists underground, the unit SHALL immediately be taken out of service.

¹ The oil temperature should be allowed to cool to reduce the amount of volume change as well as reduce the amount of volume change due to air entrapment from pump vortexing.