

Elevator Mechanic NEII-NEIEP Exam

QUICK REFERENCE CHEAT SHEET ASME
A17.1 · ELEVATOR SAFETY CODE

ELEVATOR TYPES — KEY DIFFERENCES

Type	Drive System	Key Characteristics
Traction (geared)	Motor + gearbox + sheave	Moderate speed; 100–500 fpm; low/mid-rise
Traction (gearless)	Direct-drive motor + sheave	High speed; 500+ fpm; high-rise buildings
Hydraulic (holed)	Oil + piston in ground	Low-rise; max 6 floors; slower; no overhead
Hydraulic (holeless)	Telescoping cylinder or roped	Low-rise where drilling is not possible
MRL (machine room-less)	Drive in hoistway or overhead	No separate machine room; space-efficient

ASME A17.1 — CRITICAL SAFETY REQUIREMENTS

Device / Rule	Requirement
Safety device (car)	Stops car if overspeed or rope failure — activated by governor
Governor	Triggers car safety at overspeed; set at 125% of contract speed
Buffers	Energy absorbing devices at bottom of pit — oil or spring type
Door reopening device	Required on all automatic elevators — prevents doors closing on passengers
Car top inspection	Car top inspection station required — max speed 150 fpm in inspection
Pit stop switch	Required at each pit access point — must stop all movement

ELECTRICAL & CONTROL SYSTEMS

Topic	Key Fact
Variable frequency drive (VFD)	Controls motor speed for smooth leveling; standard on modern traction elevators
Safety circuit	Series circuit — ANY open contact stops the elevator immediately
Final limit switches	Upper and lower — stop car before hitting buffers; hard-wired to safety circuit
Phase reversal protection	Stops motor if 3-phase power phases are reversed
Grounding requirements	All metal parts must be grounded per NEC; machine room equipment bonded
Firefighters' service (Phase 1)	Returns car to designated floor; opens doors, remains open

EXAM-DAY TIPS

- Safety circuit = series circuit; one open contact stops the car — any single failure = shutdown.
- Governor triggers the car safety at 125% of contract speed (ASME A17.1).
- Car top inspection mode: max 150 fpm — allows mechanic on top of car.
- Pit stop switch must be at the pit access — required by ASME A17.1.
- Firefighters' Phase 1: all cars return to designated level; doors open and stay open.
- VFD (variable frequency drive) = key to smooth starting, stopping, and floor leveling.
- Hydraulic elevators: oil spills in pit are a major environmental hazard — containment required.

10 Questions That Fail Most Elevator Mechanic Candidates

These exact topics appear on the real exam — and most candidates get them wrong.

SAFETY CIRCUIT

The elevator safety circuit is wired in:

- A. Parallel — all contacts must close
- B. Series — any open contact stops the car
- C. Mixed — some in parallel
- D. Loop with redundant backup

✓ **B — Series; any single open contact stops the elevator**

NEC: ASME A17.1: Safety circuit is series wired; one failed/open device = elevator stop

GOVERNOR SPEED

The car safety device is triggered by the governor at what speed?

- A. 100% of contract speed
- B. 110% of contract speed
- C. 125% of contract speed
- D. 150% of contract speed

✓ **C — 125% of contract speed**

NEC: ASME A17.1: Governor sets at 125% of contract speed; activates car safeties

CAR TOP INSPECTION

Maximum elevator speed during car top inspection operation?

- A. 50 fpm
- B. 100 fpm
- C. 150 fpm
- D. 250 fpm

✓ **C — 150 feet per minute**

NEC: ASME A17.1: Car top inspection speed ≤ 150 fpm to ensure mechanic safety

PIT STOP SWITCH

A pit stop switch is required:

- A. Only in pits deeper than 6 feet
- B. At each pit access point
- C. At the machine room panel only
- D. Only for hydraulic elevators

✓ **B — At each pit access location**

NEC: ASME A17.1: Pit stop switch at each access point; stops all elevator movement

FIREFIGHTERS SERVICE

When Phase 1 Firefighters' Service is activated, the elevator:

- A. Goes to any floor with call
- B. Returns to designated floor, doors open and remain open
- C. Shuts down immediately
- D. Operates at reduced speed

✓ **B — Returns to designated floor; doors open and stay open**

NEC: ASME A17.1 Phase 1: Returns to fire recall floor; doors open to show car is empty

HYDRAULIC ELEVATOR

Hydraulic elevators are most limited because they:

- A. Require a machine room
- B. Are limited to approximately 6 floors
- C. Use more electrical power
- D. Cannot be used commercially

✓ **B — Typically limited to 6 floors (50–60 ft)**

NEC: Hydraulic: cylinder depth limits height; not suitable for mid/high-rise buildings

VFD PURPOSE

A Variable Frequency Drive (VFD) in an elevator primarily:

- A. Controls hydraulic oil flow
- B. Protects against power surges
- C. Controls motor speed for smooth leveling
- D. Monitors safety circuit continuity

✓ **C — Controls motor speed for smooth acceleration and precise floor leveling**

NEC: VFD = variable frequency drive; allows precise speed control for comfort and accuracy

BUFFER TYPE

Oil buffers are used at elevator pit bottom because they:

- A. Are less expensive
- B. Provide greater energy absorption for higher speed elevators
- C. Are required by ASME for all elevators
- D. Are easier to maintain

✓ **B — Greater energy absorption; required for higher-speed applications**

NEC: Oil buffers: used for speeds > 200 fpm; spring buffers only for ≤ 200 fpm

DOOR REOPENING DEVICE

Door reopening devices are required on automatic elevators to:

- A. Prevent doors from opening at wrong floor
- B. Stop doors from closing on passengers
- C. Sync door speed to car speed
- D. Open doors automatically at destination

✓ **B — Prevent doors from closing on passengers (safety edge or light curtain)**

NEC: ASME A17.1: Door reopening device required on all automatic power-operated doors

PHASE REVERSAL

Phase reversal protection in an elevator motor circuit prevents:

- A. Overvoltage damage
- B. Motor running backwards due to reversed phases
- C. Ground faults
- D. Overcurrent

✓ **B — Motor running backwards if 3-phase power connections are reversed**

NEC: Phase reversal: 3-phase motors run backwards if phases reversed; protection trips the circuit

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