

## Minimum Equipment Performance Standards and Preventive Maintenance Required Under the Contract

Frequency of Inspections: Semi-monthly

Each inspection to be signed for by the Owners Representative.

1. Specific Equipment Performance Standards:
  - a). Call-back: Normally four to possibly six per year, excluding nuisance calls.
2. Minimum expected periodic servicing, checking, oiling, and adjustments:
  - a). Every 2 weeks: Ride the car, observing operation, adjust in tank with car at top.
  - b). Every 13 weeks: Check adjustment of car doors and door operator, adjust if needed, check landing switches, check guide lubricators and lubricate.
  - c). Every 26 weeks: Clean and examine Saf-T-Edge, door guides and fastenings.
  - d). Every 52 weeks: Clean, oil and adjust all hoist-way doors, check all control switches, car and corridor stations. Check and make sure that all electrical connections are tight.
  - e). Other: Every 5 years consideration should be given to the need for oil filtration or replacement. If it is dirty, change the oil, you are being paid to maintain the equipment.
3. Doors and Operation: Frequency of inspection and adjustment briefly covered above.
  - a). Car and Hoist-way Doors: Clean and lubricate track and hangers as needed. Check backplate and hanger to door fastenings, relating devices to insure tightness. Check up-thrust adjustment and fastening (nominal 0.010" to track), should clearance exceed 0.035" it should be adjusted. Check tightness of relating devices. Door interlock adjustment to be set to permit the latch to drop within 3/8" or less of full closure. Check contact setting for pressure and contact wipe. Bottom door guides should be fastened tight and replaced when panel may be moved in and out by 1/4" or more. Check and tighten non-vision wings/sight guards at each inspection. Final latch cam and spring adjustment to be set to fully close the doors to locking position when within 1" to 1 1/2" of full closure. Car door contact should be set to prevent car movement unless door is 2" or less from full closure.
  - b). Car door safety device should be checked quarterly for freedom of movement to permit it to operate with even a somewhat glancing blow, but not sloppy permitting it to rub against door. Where retractable projection is used at the opening, it should be slightly in

**Attachment C – Hydraulic Passenger Elevators**  
**RFx 3000022916**

front the door and should permit the door to be held in the open position with pressure on the edge, in closing, edge should permit door to reopen within 1-1/2” of full closure or less.

Reopening action should be such that reversal of the door movement will occur at such a point or before the leading edge of the vane and doors are in the same plane. i.e. at or before the complete collapse of the edge. Active contact line of the edge should be free of cuts and bulges. Control contact cable and retracting cable, where used should be held clear of snagging on other moving parts. Maintain car door kinetic energy and door pressure within ASME A17.1 code requirements at all times. Electronic door detectors are to be set to fault to the open position. Maintain door nudging within ASME A17.1 code requirements.

- c). Door Operator: Check, lubricate, and adjust quarterly, where gear operators are used, gear oil level should be checked and the unit cleaned and flushed and refilled within five years. Opening motions should be at design speed smooth start, slowdown and stop, with particular care being taken to avoid drag in the opening action as the door reaches full open position. Closing time should be adjusted to comply with the current requirements on kinetic energy and smooth start and stop. Closing adjustment should permit door reversal within travel of the Saf-T-Edge as above without further drift.

4. Control:

- a). Regular inspections and adjustments as outlined above. The effects of control fault can be most easily detected for individual car operation by riding the unit and observing operation. At each scheduled control inspection the operation of the relays in the panel in normal service can suggest trouble areas, erratic relay operation or contact sparking. Touch up adjustment suggested by these observations can frequently avoid drift off of adjustment and a major tune up, or failure of a more serious nature. Mechanical check of relay operation can best be done with the power off, testing contact pressure and wipe, as well as friction where relays appear sluggish. At first power cut off check frequent operating relays for overheating by touch. This should be done particularly for relay in the circuit where undue sparking is apparent. At the same time transformers and rectifiers should be checked for heat. The rectifier voltage should be periodically checked and compared to posted values, confirming periodic check and recording variation, if any. Contacts should be found to be clean if contact wipe is sufficient, they should only be dressed if they have developed ridges, blisters, or are excessively pitted. Should the condition be beyond correction they should be replaced. On occasion pins or relay fulcrum points may give rough or sluggish relay action and may need slight lubrication or dressing.

Proper values of timing relays should be posted on the control cabinet or panel and checked at control inspection schedule. Particular attention should be paid to all overload and phase failure relays where they are used checking adjustment and freedom of movement. A log of corrections and adjustment of each controller, studied at each

**Attachment C – Hydraulic Passenger Elevators**  
**RFX 3000022916**

scheduled inspection can be a time saver in clearing troubles and preventative maintenance adjustment.

**5. Valve and Power Unit:**

- a). Valve adjustment is only required when trouble is encountered with control contact and valve oil failures, and is the first area check. Strainers should be checked on a quarterly basis, with oil level checked each visit. The condition of the oil, clarity, color and odor should be checked each year or in the event of excessive leveling and speed adjustment problems. Any evidence of moisture in the oil suggests replacement, clarity, a cloudy oil should be filtered and the filtering sequence repeated at least once several days later to make sure the residual oil in the cylinder circulates and is also filtered. Change in odor or color suggests that a chemical analysis is needed. Check the condition of belts and their tension on the power unit on a quarterly basis. In the event oil is discovered by seeping through the packing re-introduced, the contractor is to check for clarity.
- b). Motor: Check bearings for heating and lubrication every four weeks. Blow out yearly, check insulation of coils and apply insulating paint every three years. Dry and brittle, insulation can result in a burn out and fire. It must be remembered that coils in motors that are in stock can get brittle and their insulation should be examined and restored as needed.

**6. Cupped Equipment:**

- a). Jack Unit and Piping: Plunger and guide bearing, packing gland, casing gasket, packing and piping system including valves should be checked quarterly and adjusted and repaired as required. It is understood that the casing, underground piping and inaccessible wall lines in wall and ceiling are not an obligation of the contractor.
- b). Cupped Switches: Should be checked for contact pressure, wear and wiper, quarterly where involved in the landing of the elevator, annually for all safety equipment, slowdown and limits.
- c). Car and Corridor Stations: Should be opened up each year for cleaning and switches each examined for positive action, contact pressure, wiper and wear. All connections should be checked to see that they are tight.
- d). Guides and Guide Shoes: Should be checked monthly for lubrication, wear and condition. Oilers should be filled as required. Rails should be examined for possible scoring and redressed if necessary. If roller guides are used they should be checked and lubricated as necessary, if there are signs of wear, deterioration or rough surfaces, new rollers should be installed to replace those removed.