

PART II – PRIMARY SYSTEMS INFORMATION

7. ELEVATORS

2. Preventive Maintenance

a. Preventive Maintenance Plan and Schedules:

(1) Safety Precautions: When working on any elevator system, the following precautions must be followed:

1. Only FULLY QUALIFIED elevator maintenance personnel should work on this Equipment.
2. ALWAYS turn off the system power at the main disconnect switch before repairing or replacing parts.
3. When it is necessary either to remove terminal wires or jumper wires, ALWAYS place a red tag on the wire or terminal.
4. Before returning the car to service, make sure that ALL terminal disconnections have been replaced and ALL jumpers removed.

(2) Preventative Maintenance Routines: Preventive maintenance routines are divided into four groups with respect to the frequency of performance, i.e., Monthly, Quarterly, Semi-annual, and Annual intervals, Refer to Table 6-1 to determine the applicable lubricant.

(3) Corrective Maintenance Routines: Corrective maintenance, repair and adjustment instructions are included for the Jack Packing, Hydraulic Pump, Hydraulic Control Valve and Door Operator.

(4) Table 6-1 Recommended Lubricants:

ITEMS	LUBRICANT
Pump Unit	Unocal #UNAX-AW32
Buffer, Oil	Shell Macoma 68
Hoist way Limit Switches	Essolube MDX-30 or Almasol #1225
Interlocks and Gate Switches	Essolube MDX-30 or Almasol #1225
Hoist way Doors and Car Doors	Essolube MDX-30 or Almasol #1225
Car Door Operator, Motor, Gears, Chain	Standard American Oil Rykon #2EP, Shell Alvania (3 or R#), NLGI Essolube MDX-30 or

	Almasol #1225
Car Door Clutch and Safety Edge	Essolube MDX-30 or Almasol #1225
Car Limit Switch Assy.	Essolube MDX-30 or Almasol #1225

(5) Monthly Routine:

(a) Car Operation: Observe and note the operation of the car, doors, hatch doors, acceleration, deceleration and landing stops. If equipped with light rays or safety edges, see that they operate satisfactory. Investigate all unusual noises and conditions. Make corrections.

(b) Signals: Make visual inspection of all push button, signaling and operating devices. Check for burned out bulbs, broken push buttons and faulty switches. Test the emergency stop and bell; Test emergency battery pack and light.

(c) Hydraulic System: Check and fill the oil tank. Look for oil leaks around the plunger and at the pump.

(d) Cleaning Hoistway: Clean car top, car top accessories and pit.

(6) Quarterly Routine:

(a) Car Door Operation: See that setscrews holding the drive pulley to the motor shaft have not worked loose. Adjust belts in found to be slack. Be careful not to make them too tight, as it will create friction on the motor and idler pulley shaft bearings. If door operation is erratic, make sure that mechanical parts are in good adjustment before making electrical adjustments. See that oil is to proper level, if mechanical check is used. Check the gate switch and limit switch contacts, clean and adjust where necessary. Examine door gibes. If tight in groove, remove and clean them. Examine drive blocks for wear and drive vane for tightness and proper adjustment.

(b) Pump and Pump Motor: Inspect motor for excessive dirt, friction or vibration. Dust may be blown from inaccessible areas using compressed air. Keep the ventilation openings clear to allow free passage of air. Overheating of the bearing caused by excessive friction is

usually caused by either a bent shaft or excessive belt tension.

Damaging vibrations can be caused by loose mountings or by excessive belt tension. The motor is equipped with double shield ball bearings having sufficient grease to last indefinitely under normal service. Where the motor is used constantly in dirty, wet or corrosive atmospheres, it is advisable to add one-quarter ounce of grease per bearing every three months. When greasing the bearings, keep all dirt out of the area. Wipe the fittings completely clean and use clean equipment. More bearings failures are caused by dirt introduced during greasing than from insufficient grease.

Should the pump develop noise after satisfactory operation, it is usually due to one or more of the following conditions: Excessive suction lift requirements due to cold fluid or clogged strainer, air entrapment in the fluid or low fluid level in the reservoir, misalignment of the coupling, overload of the pump (excessive pressure in the system), or excessive wear or damage caused by contamination.

(7) Semi-Annual Routine:

(a) Door Interlocks: Pull on each hatch door while car is running to see that door is securely locked and that car does not stop because of an interrupted door circuit. Test door interlock circuit at control panel for grounds, high resistance and for leakage between primary and secondary circuits. Use an ohmmeter for this test. Make a visual and physical examination of door locks; rollers and levers, without removing interlock covers. Examine door closer equipment in a like manner. If interlock troubles have been excessive, complete mechanical and electrical adjustments should be made at all openings.

(b) Guide Shoes and Roller Guide: Examine car guide shoes for loose fastenings and excessive play in shafts and bearings. Do not permit shoes or wheels to wear to a point where they are in danger of the car leaving the guide or where there is a possibility of the leveling sensors striking the vanes. Roller guide should be inspected for clearance between side roller and rail and the face roller for tightness.

- (c) Car-Station: Remove cover and clean out car operation box. Clean and lubricate car switch, car buttons and other switches.
- (8) Annual Routine:
- (a) Controller: With main line switch out, examine each contractor and relay by hand. See that rivets and screws are tight, air gap is not excessive and there is no friction. Examine shunts; replace those that are frayed or otherwise indicate that they might soon break down. Examine the non-magnetic material that prevents DC operated switches from hanging in mechanically. Adjust or replace those that are sufficiently worn to allow the armature to strike or nearly strike the stationary core. AC relays and contractors should be checked to see that the contact area of the magnetic cores have not increased sufficiently to cause them to a hang in. A simple test is to block out all contacts so they cannot touch the stationary carbons, pick up the switch electrically, and they see if it drops out immediately when the circuit is open. If it hangs in, slotting them with the sharp corner of a file should reduce the contact area of the magnetic cores. Check heavy wire terminal for tightness, devoting particular attention to those connected to overload relays. Tighten nuts, which hold resistance grids tight to each other. Clean contacts of relays, which seldom operate; i.e.; overload relays, phase relays, field protective relays, etc. Check oil level of dashpot operated overload and time relays. Check fuses for temperature and correct size. Clean and tighten fuse holders as necessary.
- (b) Repairing the Jack: Due to the normal wiping action of the seal on the piston, there will be a re-routing of approximately one to three gallons of oil per month into the recovery system. (Pit can or scavenger valve). If this amount should be exceeded the packing should be replaced in accordance with the procedure set ford below using the tools and materials listed in table 6-2:

Table 6-2 Tools and Materials Required to Repack Jack:

Item	Amount
Packing, Tex-A-Cone or equivalent (The proper diameter for the piston	One each

Size)

Fine-Cut, small flat mill file wet or dry

Sandpaper, 360-grit

six sheets

Hand Cleaner

One can

Solvent

One can (gal.)

Clean Rags

One small box

Hardware block 10 x ¾ x inches

On each end

Carefully inspect the full length of the plunger for any scratches or burrs, which might damage the packing.

Note: All filling and sanding on the plunger must be in horizontal direction around the plunger. Vertical scratching will cause leaking.

A. Carefully remove any severe stags of burrs with the file. (Use a rolling motion around the curve of the plunger).

B. Remove any other burrs or minor imperfections with the sandpaper.

C. If the surface of the plunger is covered with a dirty film of oxidized oil or warmish. This film should be removed as follows:

1. Raise the elevator to the top floor and stop the car by pulling the pit disconnect switch.
2. Apply the hand cleaner to the plunger with the sandpaper.
3. Wipe the plunger with clean rags.
4. Remove the hand cleaner residue from the plunger with solvent, wash thoroughly with water, and dry with clean rags.
5. Put in a DOWN call, connect the pit disconnect switch, over the car downward, and pull the pit disconnect switch.

D. When the plunger is smooth and clean, place the repacking support props in position, and lower the elevator onto the props to relieve the oil pressure in the system.

E. Pull the main disconnect switch and padlock in to remove main power.

F. Close the shutoff valve in the feed line if such a valve exists. If there is no shutoff valve, shut the oil off at the tank with a valve plug.

G. Remove the packing gland bolts, carefully raise the gland, and secure it in the raised position using care not to mar the surface of the plunger.

Caution: Insure that the gland is secured properly to prevent injury to personnel during the repacking process.

H. Replace existing packing with new Tex-A-Cone or equivalent (proper size).

I. Thoroughly oil the packing plunger and recess.

J. Carefully lower the packing gland, and tighten the gland bolts fingers-tight.

K. Tighten the gland bolts about one turn, which is the proper adjustment.

L. Check that the packing gland is level and that the oil overflow is free of dirt.

M. Re-apply main power and operate the elevator through several trips.

Note: A slight oil film on the plunger is desirable. Persistent squeaking, improper leveling, or rough breakaway will indicate too tight packing.