Stannah Lift Services Limited

WORK METHOD - 3 - Planned Maintenance (Explanatory notes to be used in conjunction with Planned Maintenance Log Card F9).

As a Service Company, as the title implies, our aim is to supply a Service to our Customers. The aims of that service are to ensure that we keep our customers lifts and escalators in optimum working condition, safely and reliably.

To help achieve these aims we are introducing the Stannah Maintenance System.

The object of all our efforts is to achieve customer satisfaction, because without this we will not have any customers and thereby lose our reason for existing.

How this Manual Works

This manual is not intended as a technical document but a guide to operating the Planned Maintenance System.

The system provides a way of executing a programme of maintenance to ensure that every part of an installation is checked during a year, at suitable intervals.

The manual also explains what 'WORK PHASES' are and how they should be carried out.

1.00 THE LOG CARD

The Log Card provides a guide to what works must be carried out during each particular visit. A brief description of this work is shown on the Log Card as both a guide for the engineer and for the information of the customer.

At the top of the Log Card there is an instruction for the procedure to be carried out on every visit, part before commencing and part after finishing the relevant work phases.

The Log Card also provides a means of recording what maintenance work has been carried out and when, and for keeping a Call-Out/Repair history.

Each individual installation may have its own special requirement, and these are to be recorded in the space provided.

The Log Card also records the following:-

- **Site Address**
- **Contract Number Type and Frequency**
- **LG1 Examination and Tests**
- **Rope Certificate Number**

The Log Card should be displayed in a safe and prominent position in the motor room.

NB: On completion of the Log Card the Stannah Lifts Limited 'First Report Form' is to be completed on the initial visit.

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2.00 FOLLOWING THE SYSTEM
Following the system is easy and should be approached in the following way:-

2.01 When arriving on site, report to the customer representative -

a) ask if there have been any problems since the last visit.
b) in the event of a single man working, ask the customer representative to periodically speak to the engineer to ensure his well-being.

2.02 Ride in Lift

a) display 'Lift Out of Service Notices'
b) check all buttons and illuminations
c) check door operation, safety edges and alarm bells for correct operation
d) check quality of ride in car
e) check levelling for smoothness and accuracy
f) check all car interior equipment
g) check Log Card for any special requirements
h) for new lifts, check that the CE mark is clearly visible

2.03 Complete appropriate P.M. phase(s)
(Detailed explanation follows in section 3 of MANUAL SAFETY)

SAFETY
STRICT ATTENTION MUST BE PAID TO SAFETY CHECKS, AS HIGHLIGHTED IN THIS WORK METHOD.

2.04 Complete Log Card by ticking work phases completed, sign and date.

2.05 Obtain customer signature on worksheet.

2.06 Advise office immediately of any dangerous or potentially dangerous situation, and of any urgent repair requirements. QSP / 014 must be completed.

2.07 Inform customer of any damage to lift equipment due to wilful or accidental means by others.

3.00 PLANNED MAINTENANCE WORK PHASES
There are 12 work phases and following them is simple and should be approached as follows:-

3.01 For monthly visits complete one work phase during each visit, starting at phase one working through the year to phase twelve.

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3.02 For bi-monthly visits complete two work phases during each visit, starting at phases 1 & 2, working through the year to phases 11 & 12.

3.03 For quarterly visits complete three work phases during each visit.

3.04 For bi-annual visits complete six work phases during each visit.

Note: Some parts of work phases are repeated in each phase, some in every other phase, some in every third phase, some in every sixth phase and others appear only once in all twelve.

For visits other than monthly, work that is repeated need only be carried out once.

EXAMPLE: For Quarterly Visit Phase 1-3

Phase 1 includes 5 items of work
Phase 2 includes 5 items of work
Phase 3 includes 4 items of work

Items 1 & 2 of all 3 phases are repeated and therefore only needs doing once.

Item 5 of phase 1 is repeated in item 4 of phase 3 and only needs doing once.

Therefore this example of a quarterly visit only consists of 9 items and not 14.

Before commencing a work phase, consideration must be given to any items not complete during the previous visit.

If due to necessity an extra item is completed from a future work phase, this item may be omitted when it is next due to avoid unnecessary repetition. **Note:** that this should be kept to a minimum and only be done with a Supervisors consent.

Any such items must be highlighted on the Log Card by drawing a ring round the appropriate tick.

4.00 EXPLANATION OF WORK PHASE ITEMS

A CLEAN CAR TOP, PIT, MACHINE ROOM AND EQUIPMENT

1) remove all extraneous material from car top, pit and machine room.

2) remove any excess oil or grease from lubricated parts.

3) remove dust from car top and machine room equipment by wiping clean.

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4) inform customer of any non-lift materials stored in motor room and advise that they should be removed.

5) check all notices in motor room e.g; **Electric Shock, Handwinding.**

6) check motor room.

7) check lifting beam is marked for safe working load.

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B INDICATORS, SIGNALS, PUSHES AND KEYSWITCHES

1) check all indicator and signal lamps and replace where necessary on STANDARD, PREMIUM or COMPREHENSIVE CONTRACTS.

2) check all digital indicators for correct operation.

3) check all direction signals and annunciator gongs.

4) check operation of firemans switch.

5) check all push buttons and key switches for correct operation.

C TOP WHEELS AND DIVERTORS

1) clean all wheels.

2) check all bearings for wear and lubricate as necessary.

3) check tightness of fixing bolts and keyways.

4) check grooves for wear.

5) check wheel house stop switch and door contacts.

SAFETY ITEM
REFER TO INSTRUCTIONS REGARDING SAFETY CHECKS ON PAGE 'X' OF THIS WORK METHOD.

D CAR ENTRANCE & OPERATOR

1) clean all car entrance equipment and back of doors.

2) check top track, hanger rollers for wear and adjustment, lubricate if appropriate.

3) check all kicking rollers for wear and adjustment.

4) check all aircords or chains for wear and correct tension.

5) check car gate electric contact for operation and adjustment. Check gate locks or matthews catches.

SAFETY ITEM
REFER TO INSTRUCTIONS REGARDING LOCK CHECKS ON PAGE 'Y' OF THIS WORK METHOD.

6) check door operator for correct operation, lubricate all linkages as necessary.

7) check adjustment and operation of retiring ramp.

8) check safety edge / detector / light ray for operation and adjustment. Check all moving cables for damage.

9) check bottom track and clean. Check door shoes.

10) check all levers, hinges and pins on manual doors or gates and lubricate as necessary.

11) check gaps around doors, check doors for plumb.

12) check emergency lighting in car.

E LANDING ENTRANCE

1) clean all equipment and back of doors.

2) check top track hanger rollers for wear and adjustment, lubricate where necessary.

3) check all kicking rollers for wear and adjustment.

4) check all aircords or chains for wear and correct tension.

5) check all locks for adjustment and operation ensure optimum setting is achieved.

SAFETY ITEM
REFER TO INSTRUCTIONS REGARDING LOCK CHECKS ON PAGE 'Y' OF THIS WORK METHOD.

6) check all lock rollers for wear and adjustment, check running clearance.

7) check correct operation of door emergency release.

8) check door closer (weights, springs, dictators, etc.)

9) check gaps around doors. Gaps should not exceed 6mm as per BS5655 / EN81 / EN82.

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10) check bottom track and clean. Check door shoes.

11) check all levers, hinges and pins on manual doors or gates and lubricate as necessary.

F MACHINE/TANK AND VALVE

Machine

1) check all bearings and lubricate as necessary.

2) check oil levels and refill if necessary.

3) check electrical connections.

4) check worms and wheel as far as possible.

5) check sheave for wear or rope slip.

6) check sheave bolts and keyways for tightness.

7) check brake coupling, bolts and keyways.

8) check brake for wear on linings and correct operation. Check all pins and lubricate if required.

9) check brushes and brush gear.

10) check commutator.

11) check all belts (ind tacho drive Belts).

12) check operation of machine stop switch.

SAFETY ITEM
REFER TO INSTRUCTIONS REGARDING SAFETY CHECKS ON PAGE 'X' OF THIS WORK METHOD.

Hydraulic Tank and Valve

1) check oil level and top up if necessary.

2) check tank, valve and silencer for leaks.

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3) check electrical connections.

4) check operation of manometer and leave switched off if possible.

5) check setting of valve block heater thermostat.

6) check operation of any motor room heating or cooling equipment and thermostat setting.

7) check the tank heater for correct operation.

8) check all cooling equipment.

G SELECTOR EQUIPMENT

1) check for correct operation.

2) check tape, ropes and mechanical drive systems.

3) check operation of all switches.

4) check vanes are properly secured.

5) check resetting limits.

H CONTROLLER

1) clean all controller equipment.

2) check all electrical connections.

3) check all fuses are correctly rated.

4) check correct wiring diagram is available and is legible.

5) check all air gaps on relays and contactors.

6) check all contacts and braids.

7) visually check all other controller components.

8) check all overloads for correct setting. Test **yearly** and record on Log Card showing date of test and result.

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9) check ellison for correct setting.

10) check isolator and main fuses for correct rating.

11) check isolator and other switches are clearly marked.

I PIT EQUIPMENT

1) clean all pit equipment.

2) check safety gear tension frame.

3) check selector tape / rope sheave and switch, if fitted.

4) check pit emergency stop switch.

SAFETY ITEM
REFER TO INSTRUCTIONS REGARDING SAFETY CHECKS ON PAGE 'X' OF THIS WORK METHOD.

5) check compensating sheave and switch.

6) check overtravels.

7) check pit light and socket.

8) check pit ladder or pit steps are in good order.

9) check buffers are properly secured. For hydraulic buffers check oil level and switches.

10) check pit door interlock.

SAFETY ITEM
REFER TO INSTRUCTIONS REGARDING SAFETY CHECKS ON PAGE 'X' OF THIS WORK METHOD.

J MOTOR/GENERATOR/RAM AND PIPE WORK. GENERATOR

1) check all bearings and lubricate as necessary.

2) check brushes and brush gear.

3) check commutator.

4) check all electrical connections.

HYDRAULIC

5) check all joints and seals for leaks.

6) check all pipe work and ram is secure.

7) check piston for damage or rusting.

8) check that rubber sleeving around ram support is sound.

K GOVERNOR AND SAFETY GEAR LINKAGES

1) clean governor and safety gear linkages, lubricate as necessary.

2) check switches and sheave.

3) check car linkages and torpedo release.

4) check car safety gear switch.

SAFETY ITEM
REFER TO INSTRUCTIONS REGARDING SAFETY CHECKS ON PAGE 'X' OF THIS WORK METHOD.

L MOTOR & GENERATOR BRUSH GEAR

1) clean brush gear.

2) check all brushes and commutator.

M CAR EQUIPMENT

1) clean car equipment.

2) check operation of test control and emergency stop switch.

3) check safety gear switch.

SAFETY ITEM
REFER TO INSTRUCTIONS REGARDING SAFETY CHECKS ON PAGE 'X' OF THIS WORK METHOD.

4) check all car top switches / limits, proximity switches, mac switches etc.

5) check load weighing switches.

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6) check car guide shoes and oil pots.

7) check travelling flexes.

8) check 2/1 sheave.

9) check car isolation.

10) check relevelling operation.

11) check car telephone for correct operation.

N LIMITS AND WELL SWITCHES

1) clean all limits and well switches.

2) check all limits and switches are properly secured.

3) check operation.

SAFETY ITEM
REFER TO INSTRUCTIONS REGARDING SAFETY CHECKS ON PAGE 'X' OF THIS WORK METHOD.

4) check all tyres and rollers for wear.

O ROPES

1) check ropes for wear.

2) check rope tensions.

3) check rope hitches and tightness of rope clips.

4) lubricate, clean or dress as necessary.

P COUNTERWEIGHT

1) clean counterweight.

2) check guide shoes and oil pots.

3) check weights are secured.

4) check safety gear linkages and switch.

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SAFETY ITEM
REFER TO INSTRUCTIONS REGARDING SAFETY CHECKS ON PAGE 'X' OF THIS WORK METHOD.

Q LIFT WELL

1) visually inspect lift well and report on any building work defects.

2) check shaft screening is secure.

3) check shaft lighting.

4) check fascias are secure.

5) clean all ledges.

R GUIDES AND FIXINGS

1) clean or lubricate guides as necessary.

2) check all fixings on guides, fish plates and brackets are secure.

3) clean brackets.

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CHECK PROCEDURES FOR SAFETY CIRCUITS

When checking safety circuits all contacts should be tested to ensure that the lift stops and is prevented from starting again until the contact is reset in the correct manner.

Where meters are used to record measurements or readings, the QSCAL number of the meter used shall be recorded on the maintenance or call out repair sheet and on the log card.

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SAFETY CONTACT CHECK PROCEDURES

During routine lift maintenance all the landing door contacts and car door contacts should be tested to ensure that the lift stops and is prevented from starting if any **one single** contact is open circuited.

Note that these safety contacts can be bypassed on lifts fitted with advance door opening and / or anti-creep systems. The bypassing of these contacts **must only** occur when the lift is within the floor level unlocking zone controlled by levelling vanes or equivalent.

Any lift found to be running outside the preceding instruction parameters must be **immediately reported** and investigated.

The lift **must not** be left in use until the fault is cured.

END.

APPENDIX TO WM 3

Safety Contact Checks

This document is intended as guidance for the checking of safety contacts as and when required by the planned maintenance system, to ensure that they operate correctly and that checks are carried out safely, ensuring both mechanical and electrical integrity.

Ideally all contacts should be tested to ensure that they stop a moving lift and prevent a stationary lift starting in both modes of operation (i.e. Normal and Test) however this will not be possible on maintenance in most cases – for example these switches located in pit cannot be safely checked to ensure they stop a moving lift.

A list of safety contacts is shown overleaf. Those in Group A can normally be checked satisfactorily during maintenance but those in Group B, may in some circumstances, on some installations, require special attention, care or arrangements.
Instructions of checks to be made are contained in the text.

Any lifts found to have faults within the safety circuits or contacts must be taken out of service until the fault is corrected.

SAFETY CONTACTS

GROUP A		WORK PHASE
1.	Pulley room stop switch	C
2.	Door contact-pulley room	C
3.	Machine room stop switch	I
4.	Pit stop switch	I
5.	Tension weight switch	I
6.	Buffer switches	I
7.	Tape switch	I
8.	Pit door interlock	I
9.	Compensating sheave switch	I
10.	Maintenance stop switch (car top)	M
11.	Test / normal switch (car top)	M
12.	Car stop switch	B
13.	Landing stop switch	B

GROUP B		
1.	Car gate contact (S)	D
2.	Landing lock contact (S)	E
3.	Slack rope switch	K / M
4.	Safety gear switch	K
5.	Overspeed governor switch	K
6.	Final limits	M

CHECKING PROCEDURES

GROUP A

1. PULLEY ROOM STOP SWITCH (Work Phase Item C)

   a) With the lift on normal and stationery, and the stop complete, for example all doors closed) operate the pulley room stop switch.

   b) Check lift will not respond to a landing call.

   c) Reset stop switch and check the lift will respond to a landing call.

   d) Repeat the above this time with the lift switched to TEST checking this time that it will not respond to car top control.

NOTE: Where top wheels are accessed from car top then it may only be possible to check on TEST.

2. DOOR CONTACT – PULLEY ROOM – (Work Phase Item C)

   a) With the lift on normal and stationary at the stop circuit complete open pulley room door.

   b) Check lift will not respond to a landing call.

   c) Re-close door and check lift will now respond to a landing call.

   d) Repeat the above this time with the lift switched to TEST checking this time it will not respond to car top control.

3. MACHINE ROOM STOP SWITCH – (Work Phase Item F)

   a) With lift on normal set it moving by putting in a call at Panel.

   b) Operate stop push and check lift stops.

   c) Check lift will not respond to further calls.

   d) Reset switch and check lift will now respond.

   e) With lift on test, operate stop switch and check lift will not respond to car top control.

   f) Reset stop push and check lift can now be moved from car top control.

4. PIT STOP SWITCH – (Work Phase Item I)

a) With lift on normal and stop circuit complete open the lowest floor landing door and operate push.

b) Re-close landing door and check the lift will not respond to a call.

c) Reset push and check lift will now respond to a call.

d) Repeat with lift switched to test this time checking there is no response from the car top control.

5. TENSION WEIGHT SWITCH – (Work Phase Item I)

a) With lift on normal wedge, if possible, the switch so that it is open circuit.

b) Check lift will not now respond to a call.

c) Reset switch and check will now respond to a call.

d) Repeat with lift switched to test this time checking it will not respond to the Car top control.

6. BUFFER SWITCHES – (Work Phase Item I)
Where switches are fitted on hydraulic buffers, these should be checked individually following instructions a) – d) in section 5.

7. SELECTOR TAPE SWITCH – (Work Phase Item I)
This may be accessible from either the car top and / or pit.

(i) CAR TOP

a) With the lift on normal and stationary open circuit the switch.

b) Check lift does not respond to call.

d) Reset switch and check lift will now respond to call.

e) With lift on test and moving, open circuit the switch, check lift stops and will not re-start whilst switch is broken.

(ii) PIT
Follow instructions a) to d) in section

8. PIT DOOR INTERLOCK – (Work Phase Item I)

NOTE: Safety Barrier must be used to guard pit entracne whilst pit door is open.

a) With lift on normal and stationary, open pit door and check lift will not respond to a call.

b) Close door and check lift will now call.

c) Repeat with lift switched to test, this time checking lift will not respond to car top controls with pit door open.

9. COMPENSATING SHEAVE SWITCH - (Work Phase Item I)

Follow instructions a) to d) in section 5.

10. MAINTENANCE STOP SWITCH – (car top) (Work Phase Item M)

a) With lift on normal, operate car top stop switch.

b) Check lift will not respond to a call.

c) Reset switch and check lift will now respond.

d) With lift on test and moving downwards operate the stop.

e) Check that lift stops and will not restart with switch operated.

f) Reset switch and check lift will now respond.

11. TEST / NORMAL SWITCH– (Car top Control Unit) (Work Phase Item M)

a) With lift on normal, position where access to car top is possible.

b) Put normal / test switch to test.

c) Check lift will not now respond to landing calls – try this at more than one floor).

d) Restore switch to normal position and check lift will now call.

12. CAR STOP SWITCH – (Older Lifts)

a) With lift as normal and running, operate switch check lift stops and cannot be restarted with switch operated.

b) Cannot be checked on TEST.

13. LANDING STOP SWITCHES – (Goods Lift)

a) Set lift in motion using landing pushes, operate stop and check lift stops and cannot be restarted whilst switch operated. Repeat on all floors.

GROUP B

1. CAR GATE CONTACT

(I) AUTO DOORS

a) With lift on normal position, lift car so that the car door may be opened. On some lifts the opening of the car door may not be straightforward – it may for example be necessary to electrically isolate the door operator. Extreme caution must be taken against unexpected operation of the door operator.

b) Once car door has been opened, reclose the landing door and check lift will not respond to call.

c) Reclose car door and check lift will now respond to call.

d) With lift on test and in motion, carefully open the car doors by hand – again this may not be straightforward and extreme care should be taken against unexpected movement of door operator. Check lift stops and will not restart if doors are opened by more than 6mm. This check will not be possible on through cars on both set of doors.

e) NOTE: If there are 2 car door contacts fitted and it is not possible to break them individually (e.g Piccolo) then a visit check should be made to ensure the contacts are wired in series – if in doubt only way to verify is to remove a wire from each contact in turn.
Do not attempt to open car doors whilst the lift is in motion in normal operation.

Where a locking device is fitted to car doors, this should be checked on test to ensure correct mechanical operation and effective locking and also if the device allows doors to be parted slightly that the electrical contact breaks before the locking device prevents further opening of the doors.

(ii) MANUAL DOORS

a) With lift on normal and in motion pull open the car gate (if possible – it may lock when lift in motion) and check that lift stops.

b) Check lift will not restart with gate open.

c) Close gate and check lift will now move.

d) With lift on test and moving downwards, open car gate (if possible to do so safely) check lift stops.

e) Check lift will not restart with gate open.

NOTE: If car gate locks and there is no facility to safely unlock it whilst lift is moving, then it is only possible to check that an open gate prevents the lift moving.

2. **LANDING LOCKS AND CONTACTS**

MECHANICAL INTEGRITY

Check all locks, lock effectively and that it is not possible to pull open any landing door with the lift car away from that floor.

(I) AUTO DOORS

a) With lift on normal and moving check that it stops when a landing door is opened. (This check is normally a by-product of gaining access to the lift well).

b) Check that the lift will not restart whilst the door is open.

c) Check that on closing the landing door, the lift will either resume its original journey or respond to a new call.

d) With lift on TEST and moving open, each lock in turn to break each contact in turn. In each case check that the lift stops and will not restart whilst the contact is open.

NOTE: Where centre opening doors are used and two locks are fitted, both contacts must be checked individually. Where one lock is fitted and a slave contact is fitted on slave door, it may not be possible to open circuit the slave contact without unlocking the door thereby opening the lock contact. In such cases it may be possible to examine the wiring to the contacts to verify they are wired in series or it may be possible to insert a piece of insulating material to isolate the slave contact. This however will not always be possible, and it may be a wire has to be removed from the contact in order to verify its operation.

(ii) **MANUAL DOORS**

Where both a "beak" and a "lock" contact are fitted, these must be checked individually.

a) With lift in normal and moving, unlock (but do not open) and landing door.

b) Check that the lift stops and will not restart whilst the door is unlocked.

c) Relock the door and check lift will respond to a call.

d) Stop the lift between floors.

e) Unlock and open lowest floor landing door and with the door open, engage the locking mechanism thereby making the contacts within the lock.

f) Check lift will not respond to landing call from lowest floor.

g) Re-close and lock the door and check lift will respond to a call.

NOTE: On lifts like Stannah Piccolo, it is preferable to check ground floor landing lock contacts with lift positioned between floors as if the car is standing at a floor the car doors will be open.

Lifts will be encountered where car doors open if lift stops between floors.

3. SLACK ROPE SWITCH (I)

Slack rope switches may be fitted on safety or suspension ropes or chains.

They may be quite easily accessible from the pit in which case a satisfactory check can be made (follow a) – d) in section 5. If this is impractical then a test should be made during the 5 yearly LG1 test of safety gear.

On some switches however, it may be necessary to relieve the tension from the chains to actuate the switch. Such a test is beyond the scope of routine maintenance so the only way to check would be to remove a wire from the switch and then check lift will not move.

4. SAFETY GEAR SWITCH – (K / M)

As access to this switch may be impractical and unsafe, the check should only be carried out as part of 5 yearly LG1 inspection.

5. OVERSPEED GOVERNOR SWITCH (K)

If the governor is accessible then with the lift stationary, it may be tripped by hand to ensure lift is prevented from starting both in normal and in Test. No attempt should be made to trip the switch whilst lift is running. This test however does not verify the position at which the switch operates (i.e. the calibration) which should be checked 5 yearly as part of LG1 inspection.

6. FINAL LIMITS (M)

TRACTION

a) Isolate lift supply.

b) In both directions of travel, wind lift car from terminal floors and check final limit operates before buffering occurs. At this point restore power and check lift will not move or accept calls. On older machines final limit switch may be visible in machine room making the procedure far easier.
(Note 2 persons required).

(ii) HYDRAULIC

a) If possible pump up lift from top floor and ensure final limit operates.

b) When limit has operated, check lift will not respond to calls with car in this position.

For both traction and hydraulic, check final limits are not overrun when on test.